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INQUIRY TRAINING: BUILDING SKILLS FOR AUTONOMOUS DISCOVERY [1]

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A look at recent developments in education reveals that the ancient "Aha" experience of Archimedes has caught the imagination of a growing number of educators. Some have been prompted to reformulate their methods to capitalize on the intense motivation and deep insight that seem to accrue from the "discovery" approach to concept attainment. This method is being used in a number of experimental mathematics(1), science(6, 9), and social studies(11) curricula. Children are led through a programmed sequence of problems designed to make the exciting experience of independent discovery virtually inevitable. The dramatic results—particularly in mathematics and physics—have attracted national attention.

THE PROCESS OF DISCOVERY

Curiosity, and the acts of search it gives rise to, have never been successfully explained in terms of the traditional theories of motivation. White(15) has raised serious doubts as to the adequacy of Hullian and Freudian orthodoxy to account for the motivation of investigative behavior. Humans and animals alike are driven by what seems to be the urge to explore, manipulate, and master their environment. White doubts that this can be reasonably attributed to any of the commonly recognized primary drives. He postulates, instead, a *competence motivation* that leads animals to transact with their environment directively, selectively, and persistently in an effort to master it. They do this, White submits, not because it satisfies any tissue needs or reduces fears or anxieties, but because exploration, manipulation and mastery are *intrinsically rewarding*. The implications of this thesis for educational practice are enormous, particularly in view of the extrinsic and devious motivational systems (e.g., report card grades, achievement awards, punishments) still in use in the vast majority of classrooms today. But apart from motivational considerations, are there advantages to self-directed explorations and discoveries as a means of learning?

Bruner(3) speaks of the sense of "intellectual potency" that results from the repeated experience of discovery. The child not only becomes aware of regularity in a seemingly chaotic environment, but learns that he can find it for himself and put it to work. This builds the self-confidence which frees the child to make fullest use of his intuitive powers without fear of failure. In Bruner's words:

> A person who thinks intuitively may often achieve correct solutions, but he may also be proved wrong when he checks, or when others check on him. Such thinking, therefore, requires a willingness to make honest mistakes in the effort to solve problems. One who is insecure, who lacks confidence in himself, may be unwilling to run such risks(4).

This concept of intellectual potency goes beyond the build-up of self-esteem, and the expectation of regularity. Bruner suggests that learnings gained through discovery may be more accessible to the learner later on. There is additional power, he feels, in having knowledge you can use.

> I would urge now in the spirit of an hypothesis that emphasis on discovery in learning has precisely the effect upon the learner of leading him to be a constructionist, to organize what he is encountering in a manner not only designed to discover regularity and relatedness, but also to avoid the kind of information drift that fails to keep account of the uses to which information might have to be put. It is, if you will, a necessary condition for learning the variety of techniques of problem solving, of transforming information for better use, indeed for learning how to go about the very task of learning. Practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving(3).

Dewey(5) long ago urged that the schools provide opportunities for transactional learning. He believed that all children have a propensity for logical thinking but that it can be nurtured and perfected only through problem-solving experiences in which these mental processes are given free play. "Learning by doing" is an oversimplification of what Dewey had in mind. A much closer approximation of his intent would be "discovering by experimenting and thinking."

In short, what White, Bruner, and Dewey are saying is that concepts are the most meaningful, are retained the longest, and are most available for future thinking, when the learner actively gathers and processes data from which the concepts emerge. This is true (a) because the experience of data gathering (exploration, manipulation, experimentation, etc.) is intrinsically rewarding; (b) because discovery strengthens the child's faith in the regularity of the universe which enables him to pursue causal relationships under highly frustrating conditions; (c) because discovery builds self-confidence which encourages the child to make creative intuitive leaps; and (d) because practice in the use of the logical inductive processes involved in discovery strengthens and extends these cognitive skills.

A dramatic example of the power of discovery is a study by Moore(10). He allowed preschool children to "play" with an electric typewriter. Each letter that the child hit was immediately pronounced by the teacher. Later on, when the children were hitting letters in sequences, B—O—Y, the teacher pronounced the words in addition to the individual letters. Through this method the children discovered words as letter combinations, and through these discoveries induced generalizations and rules which they were able to apply to an ever-increasing range of new letter combinations. As a result these children learned to read before they were four years old. Moore reports that motivation was high and that emotional blocking and common errors such as letter inversions (e.g., *was* for *saw*) were virtually nonexistent. Bruner(4), Beberman(1), Hendrix(7), Karplus(9), Wertheimer (14) and Suchman(12, 13), have also reported results that support discovery as a powerful educational tool.

Inhelder and Piaget(8) have shed new light on the cognitive processes of discovery. While their subjects, ranging from preschool to adolescence, were manipulating physics apparatus trying to predict or control certain dependent variables, the experimenters asked the children questions about what they were doing and why. The protocols revealed that the *strategy* of investigation is a significant variable, and that it changes as children grow older. The most significant change is the onset of *operational thinking* which generally occurs about the age at which children first enter school.

Prior to this time, at the pre-operational stage, the children do not effect any major penetration of causal relationships because their manipulations are not systematized in any way that will permit them to isolate and test variables. They freely alter conditions, but they are not truly experimenting; they attend to the consequences but fail to note the *relationship between the conditions they produce and the outcomes that result*. Young children are action-oriented but not process-oriented.

When the child reaches the stage at which he can think operationally, he sees each manipulative act as an isolated, reversible move that has a specific result. He becomes more process-oriented. He regards the action and its result as a unit. He can internalize this unit, store it, combine it with other units and use it to form rules and generalizations. Thus, through operational thinking the child can go beyond the data and can form constructs that will enable him to predict and control events which he has never before witnessed.

Consider the example of the child working with a simple pendulum composed of a string attached to a fixed hook at the upper end and to a free-swinging weight at the lower end. The child is trying to find a way of shortening the period of the swing, that is, the amount of time it takes to make a complete round trip. He might substitute a lighter weight at the end of the string and observe that the period remains the same. He might manipulate a different variable or try a different weight. Eventually he may

discover that it is the length of string suspending the weight that determines the period.

So far I have described what Piaget calls *concrete operations*. They enable the child to structure the immediately present reality, and to discover relationships within this structure. *Logical operations* emerge with the coming of adolescence, according to Inhelder and Piaget's data. At this stage the child manipulates *propositions* rather than *variables*. Each operation is preceded by an hypothesis and the operation is a test of its tenability. Let us say, for example, that the child with the pendulum has discovered through concrete operations that changing the length of the string affects the period. He may then hypothesize that all pendulums with the same string length have the same period, and that the longer you make the string the longer the period will be. To test these propositions he first holds the string length constant and varies the amount of weight at the end. If the period remains constant the first hypothesis is tenable. He may then hold the weight constant and vary the string length systematically and observe the corresponding periods. If the two are positively correlated, the second proposition is also tenable. The child has now discovered not merely a set of properties of this pendulum; he has also discovered a set of rules that apply to *all* pendulums, a physical principle.

Bruner *et al.*(2) found that adults utilize heuristic strategies which correspond roughly to concrete and logical operations and combinations of them. Actually, Bruner identified four types of strategy varying in the amount of emphasis placed on memory, time, and risk. For example, *conservative focussing* was a process of systematically manipulating each of a number of independent variables under controlled conditions to determine which was relevant to the dependent variable. This approach placed very little strain on memory and if time were not a consideration, the subject would not run much risk of overlooking relevant variables or falsely attributing relevance to a variable. This is a safe but somewhat laborious procedure that would seem to be a form of *concrete operation*.

Successive scanning was a strategy that involved more risk but enabled the subject to make use of his intuitive powers. He would test successively a series of hypotheses until he found one that was tenable. This approach could have early success, especially if the subject's intuition leads him in the right direction. To the extent that each new hypothesis is formed in the light of the information gained from the previous tests, this strategy corresponds closely to the *formal logical operations* in Piaget's system.

It is important to note that Bruner's subjects did not adhere to one strategy or another throughout a problem. The predominating strategy was essentially a function of the "payoff matrix," that is, the aspects of performance which were regarded by the subjects as most important. A high reward for speed, for example, would increase the use of strategies that involved greater risk taking or cognitive strain if these shifts meant the possibility of quicker results.

In sum, there are three significant facts emerging from the research on the process of discovery: (a) exploration, manipulation, and mastery are intrinsically motivating, (b) a reinforcing sense of power and self-confidence comes from successful autonomous discovery, and (c) the strategy of data intake and processing has an important effect on the productivity and depth of discovery. These facts suggest a psychological basis for a program to improve inquiry skills.

The need for improvement is great. Current educational practice tends to make children less autonomous and less empirical in their search for understanding as they move up the elementary grades. The schools must have a new pedagogy with a new set of goals which subordinate retention to thinking.

It is clear that such a program should offer large amounts of practice in exploring, manipulating and searching. The children should be given a maximum of opportunity to experience autonomous discovery. New goals must be set for the children. Instead of devoting their efforts to storing information and recalling it on demand, they would be developing the cognitive functions needed to seek out and organize information in a way that would be the most productive of new concepts. Both the teacher and the pupil would have to be cast in new roles. The pupil must become more active and aggressive in his learning role. Direction of the concept formation process should be his own, and he should come to regard his environment (including the teacher) as a potential source of information which can be obtained through his own acts of inquiry. The teacher must abandon his traditionally directive mode and structure an environment that is responsive to the child's quests for information. The teacher must see to it that the child's efforts at inquiry are rewarded by success, that the child is able to obtain the information he needs, and that he *does* discover new concepts on his own. The teacher can help the child by posing problems that are reasonably structured and will lead to exciting new discoveries. The teacher can also coach him in the techniques of data collection and organization that will lend power and control to his searching. The educator should be concerned above all with the child's process of thinking, trusting that the growth of knowledge will follow in the wake of inquiry.

For the past four years, we have been attempting to design and test just such a program to be employed in the elementary school. The following section describes our method, which we call *Inquiry Training*.

DISCOVERY THROUGH INQUIRY

Inquiry Training has thus far been couched in the domain of physics. It is designed for children in the intermediate grades. We use short motion picture films of simple physics demonstrations to pose problems of causality. The children are asked to discover why the demonstration had the results that it had. The children learn how to attack such problems, how to inquire into the necessary and sufficient conditions for a given event, and how to

search for universal physical principles underlying the relationships they discover. They are taught a broad *schema* of inquiry which helps them identify a sequence of goals toward which inquiry should be directed for maximum productivity.

In order to move toward their goals the children must be able to obtain additional information. They do this by asking questions. Aside from the information that is available in the film itself, all data must be obtained in verbal form. Only questions that seek data are permitted, and these must be asked in a form that can be answered by "yes" or "no." The idea is to keep the inquiry as empirical and inductive as possible, without resorting to the physical manipulation of materials. The chief reason for this is the fact that the teacher has very little access to the cognitive operations that a child is performing while exploring a piece of apparatus. Our purpose is to get the children to talk more so that the teacher will have a clearer picture of how they are thinking. Even Piaget with much probing was often unable to get his subjects to give an adequate account of the thinking behind their concrete operations. By permitting children to obtain data *only through verbalized operations* (i.e., questions) we give the teacher greatly increased access—however indirect—to the children's cognitive processes. The questions are restricted to the "yes" or "no" format to eliminate open-endedness and teacher-structured answers and to assure that the direction and control of the data flow are always in the hands of the children.

The children are restricted to data-gathering questions. This forces them to operate inductively and to test their hypotheses through verbalized experiments. Just as the scientist in his laboratory cannot set forth his hypotheses to some all-wise creature who tells him if they are tenable, our subjects are not permitted to "test" their hypotheses by asking if they are valid. Instead, we require that the children construct critical empirical tests of each hypothesis, from which they can make their own inferences about tenability. We want the children to become autonomous inquirers.

The entire problem of the verbal formulation of constructs is a particularly difficult one for children. The English language is at best a clumsy vehicle for the communication of scientific abstractions. Children simply do do not have the vocabulary or facility of expression to cast what they comprehend into clear unequivocal explanations. Often they cannot verbalize a new awareness they have gained through their investigations and ask the teacher, "Am I right?". All too often the teacher cannot tell from what the child says whether or not the child does understand. And the very act of verbalization is likely to distort the newly-discovered concept.

But if the child can test his own hypotheses, the communication barrier is all but eliminated. The teacher does not provide the final word on the validity of propositions; he merely supplies the necessary responses that permit the child to perform verbal experiments of his own design. The child decides which variables he will explore. He structures his own independent

variables and predicts their effects on the dependent variables of concern to him. He asks the teacher whether his predicted results would, in fact, occur. The teacher merely answers "yes" or "no" (or indicates that the experiment was not well enough controlled for an unequivocal answer). The child must interpret this answer and continue with his experiments until he has discovered the relationships he is searching for.

This seems to be the closest thing at the verbal level to actual laboratory research. While it obviously lacks the concrete qualities of the physical manipulation of materials, this deficiency may have its redeeming features. Having to cope with remembered materials and imaginary experiments eliminates the purely concrete operations. The child cannot "play" with materials, waiting passively to see what happens and hoping that he will discover something that "pops out" at him. In order to obtain information he must formulate some kind of an hypothesis. Even in identifying objects presented in the film, he cannot ask, "What was it made of?" He must make use of the available data in the film and check these against his knowledge of the properties of matter. From this he may generate a few hunches to test. His questions would be more like this: "Was that object held by the demonstrator made out of steel?" The necessity of hypothesizing to obtain information means that each question must be *preceded* by some thought. To the extent that this sequence prevails the children are performing formal logical operations.

A second important advantage of a verbal approach of this kind is the increased emphasis on process. Without the concrete materials "staring them in the face" inviting physical exploration, children must devise more systematic and more intellectualized means to obtain the data they need. Not only do they become more aware of the significance of process, but the teacher has the advantage of being able to keep track of it. This information is invaluable for the teaching of inquiry techniques. Where the child fails to obtain enough data, makes false assumptions, draws improper inferences, neglects to follow up a productive line of inquiry, the teacher can redirect him. Where the child has obvious strengths, the teacher can reinforce these.

Providing the children with a sequence of goals is another important function of Inquiry Training. Autonomy without purpose or direction is meaningless. It is reminiscent of the pilot who announced to his passengers, "We are lost but we're making good time." The child faced with a phenomenon which he does not understand needs certain operational guidelines in order to undertake the task of discovering causality. Where do you begin? What kind of information do you need first? What is an adequate explanation? While most children—when faced with this task—don't actually ask these questions, such fundamental questions are nevertheless important. The following section is devoted to some of the answers that have served as our operational definition of inquiry in the present research program.

DIMENSIONS OF CAUSAL EXPLANATION

I shall first describe one of our films so that we can consider the answers to these fundamental questions with a specific example at hand. Typical of our demonstrations is one we call "The Bimetallic Strip." (The children are never given the film titles.) The apparatus is made of two thin strips of metal, one steel, one brass, fused together into one strip that looks rather like a long narrow spatula. It is held, steel side down, in a Bunsen burner flame by means of a wooden handle. Almost immediately the strip begins to bend downward in an increasing arc which approaches 90°. Next, the strip is dipped into a large tank of cool water whereupon it straightens out quite abruptly. The strip is flipped over and once again held in the flame. This time it bends upward, forming the identical arc, as before, but inverted. Once again it straightens out when placed in the water. The problem question: "Why does the strip bend and then straighten out again?"

Let us consider first what might constitute an explanation of this series of events. To the question: "Why did it bend?" one could answer, "Because you heated it." This is a correct answer so far as it goes. It is the way that most children explain events. The difficulty is in the oversimplified concept of causality that attributes an event to only one variable or one condition. An explanation of this kind is valid only under a very limited set of circumstances. It is predicated upon assumptions which the explainer may not even be aware he is making: namely, that all the conditions of the strip other than its temperature are held constant.

Such oversimplified explanations are typically linear and follow along a temporal sequence. A child might explain the bending of the bimetallic strip by saying that the heat made the metal soft, which made it bend. Even if this explanation were correct, which it is not, it does not relate the event to any system external to the event itself. "Explanations" of this kind are not explanations at all. They consist of some kind of causal sequence of events but they do not link independent with dependent variables in terms of universal principles. An explanation must show that an event is the inevitable consequence of a set of conditions. It should also show what universal principles this exemplifies.

Another way to explain the bimetallic strip would be to state that the metal moved into its bent shape because forces acting on the strip were made unequal by a greater expansion in one metal than in the other. This could be further explained in terms of such intervening variables as the molecular activity in each of the metals and the relation of this to expansion. This explanation is an attempt to show how the necessary and sufficient conditions for bending were met by the particular conditions that were obtained in the demonstration. Explanations of this kind are based upon the recognition of two important realities: (a) that causation is multi-dimensional and (b) that for every event there is a set of necessary and sufficient con-

ditions which can usually be produced in a wide variety of ways. The explanation is then a statement which demonstrates that the actual conditions of the episode did, in fact, satisfy the requirements of the *necessary* and *sufficient* conditions. One of the chief objectives of Inquiry Training is to shift the frame of reference for causality from the linear to the multi-dimensional form. This change opens the door to experimentation, and ushers in the formally logical stage of operational thinking.

But the statement of necessary and sufficient conditions for the occurrence of an event only tells part of the story. While such knowledge does permit one to predict and control events under a wide set of circumstances, *it does not explain why the necessary and sufficient conditions are necessary and sufficient*. For example, one of the necessary conditions in the bending of the bimetallic strip is the adhesion of the two metals to each other. If the metals were to slip against each other, rather than remaining fixed as they are in the demonstration, the strip would not bend. But what makes this condition necessary to the firm linkage of causes to effects? To answer this question one must resort to a universal principle, of which the specific condition is but a single instance. In this case geometry serves well. A cross-section of the strip can be represented by a pair of parallel lines in articulation with one another at an infinite number of points. In order to maintain all these points of contact while one of the lines becomes longer than the other, the lines must assume the relationship of concentric circles. So far, one child has reached this explanation in our experiments, *but the goal must be there*. This explanation represents the causality of a single instance in terms of broad universal principles and generalizations. This is the unification of concepts for which the scientist strives. It can and, in our opinion, should be the ultimate goal of children's inquiry as well.

THE NEED FOR INQUIRY TRAINING

In a series of preliminary studies of about 50 fifth-grade children whose intelligence was considerably higher than average we were able to determine some of the major difficulties that interfere with discovery through inquiry. To begin with, there was a marked lack of autonomy and productivity, stemming—we believe—from children's dependence upon authorities, teachers, parents and books, to shape their concepts. When given new data, or a situation in which such data were available, the children rarely organized what they had, rarely gathered more data, rarely raised and tested hypotheses or drew inferences. Instead they blocked completely, began to offer unsupported conclusions, or produced a string of stereotyped probes that led nowhere. Accustomed to having concepts explained to them in discussions, pictures, films, and textbooks, the children were unwilling or unable to plan and initiate action with the purpose of discovering new concepts for themselves—even when all the data necessary for such discovery were available on demand.

In his encounter with the bimetallic strip episode, Mark provides a typical example of the blocking associated with low autonomy. Note also his concept of experimentation as an almost random process:

Examiner: What made it go up? I'm here to answer questions.
Mark: Yes, I know. I can't think of any to ask.
Examiner: I see. Think. Try.
Mark: [Pause] Well I can't think of any questions.
Examiner: What is it you want to know? What would you want to know?
Mark: Why it bended upwards.
Examiner: What could you do to find out what things were necessary?
Mark: Try it. Ask someone who knew.
Examiner: Yes, you could ask someone that knew, but that would just be getting somebody else to tell you, wouldn't it? I mean, finding out for yourself.
Mark: Just try different things.
Examiner: What?
Mark: Well, you could get the materials and things, and then try holding the thing at a different angle.
Examiner: What do you think would happen?
Mark: I don't know.
Examiner: Can you ask me some questions to find out?
Mark: No, I can't ask you any questions.
Examiner: You're completely stumped? You have any ideas now for any rules at all that would explain it?
Mark: No.
Examiner: None at all. It's a complete mystery to you? No hunches? And no ideas as to what you could ask me to get some hunches?
Mark: No.

We got the feeling that many of the children saw no connection between asking questions and discovering causal relationships. Yet at their age they should have reached at least the concrete stage of operational thinking! It was clear that they had not had much experience in asking questions and did not feel comfortable in their new role. The main problem seemed to be the strangeness of the task. First, the rewards in the classroom had typically come for giving the *right answer*. The child comes to assume that if you always do what you are supposed to do, listen when you are supposed to listen, and read the pages in the book you are supposed to read, you can usually be sure of having the right answer. But now we were asking these children to think, and to generate questions in pursuit of discovery. This required them to plan, to make decisions, and to think creatively.

Second, the performance of hypothetical experiments with imagined materials was a new experience for most of the subjects. This highly verbal and symbolic medium for discovery literally forced them to go beyond the familiar concrete operations and into abstract propositional thinking. The transition to this new level of thinking was difficult for many, even for the most gifted among these children. As a result, their productivity was low.

By the same token, children who had had little or no experience in directing a systematic program of inquiry were often unready and afraid to assume this responsibility when faced with its challenges. Their defenses before such a menacing new freedom varied. Some children withdrew into silence, protesting that they could think of nothing to ask. Others took the bolder route and bypassed inquiry entirely. They spent the entire time "explaining," as though they completely comprehended the causality and had no need for inquiry. Still others asked random questions that apparently popped into their minds with no apparent plan or sequence. In general, the chief characteristic of this low level of autonomy was the lack of an organized program of search. It seemed as though the children would allow almost anything to influence the course of their questioning *other than* a systematic internalized plan.

A second major weakness was a lack of precision and control. Frequently questions were so imprecise or ambiguous as to render the answers useless.

Notice how Henry clouds the issue with scientific-sounding words:

Henry: Did it straighten in the water because the atoms of the heat molecules on the knife changed?
Examiner: The atoms on the [Interrupted]
Henry: Changed from a minus to a plus.
Examiner: How could you possibly find that out?
Henry: Well, it would be kind of hard, unless you did it with a telescope or a microscope.
Examiner: I can't answer that question then.
Henry: It seems that this is just another fact of science, even though it's amazing, but sometimes it takes weeks to figure out answers. I'll do the best I can to find out an answer. Did it straighten because of the quick change of temperature?
Examiner: How could you find that out?

The children had only the fuzziest concept of experimental design. Most of them regarded experimentation as the replication of an event while watching it more closely. Some thought it was a sort of random manipulation and observation. In fact, in no instance did our untrained children consider the problem of controls, or even the systematic separation of variables. Their questions were often long and rambling, loosely constructed, and lacking in the precision and control that is necessary to obtain clear precise answers. "Yes" or "no" answers are meaningless or misleading if the questions are not carefully constructed to avoid equivocation. The children made a great many assumptions without ever being aware that they were doing this. Some objects and events were verified and others went completely unnoticed. As a result, the children were raising and testing hypotheses without the complete knowledge of all the relevant data. Valid explanations were nearly impossible to induce.

Pablo thinks he has a rule that explains the bending of the blade. But his test of the rule is uncontrolled and equivocal.

Examiner: Why did this happen? Why did it bend down?
Pablo: Because the fire was getting that hot, and it got warmer and warmer and warmer, and it started melting a little, and bent down like that.
Examiner: What could you do to see if that rule is okay?
Pablo: Well I'd find out by trying it.
Examiner: What would you try? What would you use?
Pablo: I'd use the flame and the knife, and then try it myself to see if it would bend.

There were other common weaknesses. Without a systematic procedure for identifying the facts, *i.e.*, the objects, conditions and events of a demonstration, the children repeatedly overlooked significant variables, thereby preventing themselves from discovering certain physical relationships. Even where variables were isolated, the children lacked sufficient precision to pin down conditions to specific values and were seldom aware of the time dimension. "Was the blade hot?", is a typical example. What does the child mean by "hot"? Hot at what point in the experiment? How hot?

In general, the children's questions lacked clarity and definition to the point that the teacher frequently had to require them to rephrase their ideas. Long involved questions that required several answers proved to be a common stumbling block. In such cases, the child was unable to interpret the teacher's "yes" or "no" answer, since he could not determine which part of his complicated question had been answered.

We concluded from those early studies that Inquiry Training required three major objectives: (a) *Increased productivity:* The amount of inquiring by the child—the sheer number of probes would have to be increased. Expanded data gathering would tend to reduce the number of false assumptions, to overcome much of the blocking, and to provide a broader base for inductive reasoning. (b) *Increased autonomy:* The children would need to learn to initiate and direct a systematic program of inquiry with a minimum of stimulation and guidance from others. (c) *Increased discipline:* The children would need a functional understanding of the essence of experimental design and the rules of logical inference. They would need to learn how to gain greater precision and control in structuring their questions. They would require a schema, a sequence of goals, to reduce random behavior and serve as a framework for the organization of consciously formulated search patterns.

A SCHEMA FOR INQUIRY

To help children attain the objectives we had set, we designed the following schema consisting of three stages, each with its own goals. This schema is not a recipe for discovery, nor is it even a rigidly prescribed sequence of operations. Each new problem calls for the collection of different

kinds of information in different sequences. What the child must adopt, however, is a sequence of *goals* such that the attainment of the first provides the basic material for the pursuit of the second, and so forth. This is precisely what our subjects are taught. Each of the three stages of the schema has as its goal discovery at a higher order of abstraction and generality.

Stage I is called *episode analysis*. The goal of this stage of inquiry is the verification of the facts of the filmed demonstration. This included the identification of objects (and systems of objects), the verification of the conditions of the objects at the beginning of the demonstration, and the changes in these conditions as the demonstration progresses. Temperature, volume, length, pressure, and position are examples of the variables that help to describe the conditions of objects which may affect the outcome of the demonstration. When episode analysis has been carried through, the result is a tabular organization or matrix of objects and their conditions at critical points during the demonstration as exemplified in Table 1. As this matrix takes shape, it is recorded on the blackboard to serve as a reference in the rest of the inquiry process and reduce cognitive strain.

The first goal of inquiry at Stage II, *determination of relevance*, is the isolation of the relevant variables and necessary conditions. This strategy calls for the manipulation of one variable at a time while the rest are controlled. This is done by questions that set up imaginary experiments. That is, the child proposes "test cases." For example: "If the temperature of the knife had not been raised would it still have bent as it did?" When the results of the demonstration *are* or *could be* affected by these manipulations the variable is regarded as relevant. In this case if the temperature had been held constant, the blade *would not* have bent, so the question would be answered "no." Thus, the child determines that temperature is a relevant variable though he may not yet know *how* temperature and bending are related.

The second goal of Stage II is the identification of *conditions* that are necessary for the outcome of the filmed demonstration. Here again the data are gathered through a series of verbal experiments. The child can determine, for example, that metal strip will bend if the temperature is raised or if it is lowered appreciably—and the greater the temperature shift the more the bending. This is one step further than the simple determination of the *relevance* of the temperature variable. We are closer now to the answer to the question, "Why did the strip bend?". Obviously *one* necessary condition for bending was a sufficient change in temperature. In the continuation of Stage II all the other necessary conditions would be determined in this fashion.

Discovering *why* all these conditions are necessary is the function of Stage III, *induction of relational constructs*. Knowing the necessary and sufficient conditions for a given event, one can predict and control its occurrence. But to *explain* the event one must first discover what physical

TABLE 1

EPISODE ANALYSIS MATRIX—FILM NO. 18: "BIMETALLIC STRIP"

Objects/Systems	Conditions/Events								
	At Start of Demonstration			After Blade is Held in Flame			After Blade is Placed in Water		
	Temperature	Size	Shape	Temperature	Size	Shape	Temperature	Size	Shape
Bimetallic Strip	Room Temp.	Normal	Straight	>Room Temp.	Normal	Curved	Room Temp.	Normal	Straight
Metal A	Room Temp.	Normal	Straight	>Room Temp.	Normal	Curved	Room Temp.	Normal	Straight
Metal B	Room Temp.	Normal (A=B)	Straight	>Room Temp.	Normal (A>B)	Curved	Room Temp.	Normal (A=B)	Straight
Tank of Water	Water Temp. = Room Temp.			Water Temp. = Room Temp.			Water Temp. = Room Temp.		
Bunsen Burner	Produces Heat			Produces Heat			Produces Heat		

principles and relationships govern the changes that occur. Such explanations can be formulated only when relational constructs have been hypothesized, tested, and found tenable. In this case, one such construct was the relationship between temperature and volume in metals.

The productive thinking requirements at Stage III of inquiry are obviously far greater than those of the preceding stages. As in Stage II the basic operation is the experiment, but since relational constructs must first be hypothesized before they can be tested by critical experiments, the productivity of Stage III is largely a function of the scope and ingenuity of the hypotheses generated and tested. Intuition and creativity are far more critical for optimal behavior in Stage III than in the preceding two, but the prior successful completion of Stages I and II, because of the data they produce, is also clearly essential at this level of inquiry.

THE INQUIRY TRAINING PROGRAM

Our program is designed to develop an approach to discovery based on the inquiry process described above. We believe that under the right conditions children can acquire the attitudes, skills and strategies that are fundamental to the scientist's approach to research. We draw upon three well established techniques for the teaching of skills to carry out this job: (a) the structuring of an operational schema, (b) guided practice, and (c) feedback and reinforcement.

(a) *The operational schema.* Our subjects have come to us with rather vague and disorganized notions about causality, experimentation and logical inference. In observing an event or gathering data about it they have lacked a logical system within which to order the information they obtained by asking questions. Their search pattern was controlled not by an internalized logical system but by perceptual or conceptual biases. A perceptual bias leads a person to organize his search around assumptions based on immediately *apparent* causal relationships. Consider, for example, the child who is convinced that the metal strip is melting when it is heated because it *looks* so much that way. He may devote his whole inquiry to a search for the cause of the *melting*. He may never entertain the idea that the metal did not melt at all. Premature conclusions or even hypotheses tend to have a distorting effect upon inquiry. Anything that inclines a person toward an early commitment to a particular position or interpretation will not only reduce his ability to make objective inferences from the data but will also increase the bias of his data collection.

The conceptual bias stems from what the child already understands (or *thinks* he understands) about the causal relationships involved. A typical example of this is the case where a child regards the bending of the bimetallic strip as the result of some magnetic force pulling on the strip. He *decides* that if the strip is made to bend, it must be that magnetic forces are at work on it. He then sets about "learning" why the magnetic force

is greater when the strip is hot and why it pushes instead of pulling when the strip is turned over. He has, in effect, become fixed or rigid in his approach to inquiry. Once convinced that a particular object, condition or principle is the "cause," most subjects abandon episode analysis and launch into tests of their wholly intuitive hypotheses.

The schema provided through Inquiry Training reduces this kind of conceptual distortion. The subject adopts a framework for the analysis of physical episodes. He learns that every episode contains objects, that the state of an object at a given time can be described by a set of attendant *conditions,* and that any change in a condition is an event. He recognizes as *independent* events those changes in conditions that are made by the demonstrator, and as *dependent* events, those changes resulting from the demonstrator's manipulation of the situation. The child learns to identify first all objects and systems, then to determine their conditions both at the beginning of the episode and immediately following each independent event.

This type of analysis emphasizes the variables of an episode and their co-relationships. The matrix brings together the data in a form that suggests hypotheses and thus greatly facilitates Stage III.

Of course, the most desirable feature of this phase of the training is the systematic basis this approach gives to data gathering. The child has a search plan which is independent of the data he obtains or his own premature hypotheses of cause and effect. It promotes the discovery of relatively obscure—though possibly crucial—data which might otherwise have gone unnoticed.

We have discovered that one of the most important advantages of this schema is the feeling of assurance it gives the child who is just starting out on a new problem. He has a plan of operation and knows where to begin. In the midst of strange materials and events the child has the reassuring sense of being in familiar territory. From all appearances, this reduces blocking and strengthens inquiry.

(b) *Guided practice.* Our subjects probably make the greatest progress in inquiry techniques through their practice sessions with the physics demonstration films. Each week they work on a new film, trying through their questioning to obtain the data they need to discover the "why" of each episode. The schema takes on new meaning as the children use it productively. And in the process, they invent new search models and techniques that grow into a repertoire of refinements of the basic design, which is given to them more as a guide than as a formula.

The practice sessions are conducted with groups of children. The problem is posed to the group as a whole, and active participation in the questioning is voluntary. The children raise their hands to ask questions and may continue to "have the floor" as long as they have questions to ask. Obviously, all the children can benefit from the information gained through

all the questions asked. Children can thus be gathering data just by sitting and listening.

The group approach was originally chosen to make Inquiry Training amenable to the classroom. At first we considered group inquiry a necessary but unfortunate alternative to individual practice where each child is entirely on his own and can obtain a maximum of experience in autonomous discovery. But in an early pilot study, we had unmistakable evidence that many children failed to make progress in individual training sessions because they simply did not generate enough questions within the allotted time to give them the necessary amount of practice and feedback. On closer examination of the protocols it appeared that these low-performing children seemed to feel under pressure when they had to produce in a "solo" situation. As in many interviews there was probably a feeling that the exchange must be kept moving at all costs. It is well known that this kind of pressure produces either blocking or stereotyped behavior. In any case, thinking, and especially productive thinking, is impaired. In the group sessions the pressure is off the individual. He may pose a question if he needs a particular item of data, or he may sit back and try to organize the data obtained by other children's questions. In actual practice the children compete strenuously for recognition and for a chance to ask their own questions. This particular kind of pressure is eased somewhat by the rule that permits a child to keep the floor as long as he continues asking questions. Another advantage of this rule is that it permits children to organize a sequence of probes according to a particular strategy. It enables them to perform such logical operations as *serial ordering* or *class inclusion* in the same way that Inhelder and Piaget's subjects do.

One additional characteristic of the training sessions should be pointed out. The demonstration films are organized and presented to maximize conceptual expansion. Each film involves some concepts that would have been discovered in previous films plus a new concept or a drastically new variation of a previous one. We have done this to give meaning and purpose to the inquiry process and to give the children a sense of progress. By pyramiding concepts in this fashion we are attempting to take full advantage of the motivational power of the sense of mastery postulated by White(15). Inquiry for inquiry's sake is apparently non-rewarding. Children quickly lose interest. But inquiry for discovery's sake and for the sake of new comprehension and insight is highly rewarding.

(c) *Feedback and reinforcement.* In devising the Inquiry Training program, we have taken the position that inquiry becomes increasingly productive as it approximates certain standards of form, strategy and logic. While it is conceivable that children can with enough practice ultimately discover the most effective procedures, this prolonged and somewhat risky process (there is a real limit to how long a child will continue to experiment

unsuccessfully with home-made strategies) is not practical in the classroom.

We have found that early success in autonomous discovery has enormous motivational value. Our subjects in all our studies have responded well to redirection and both positive and negative reinforcement with respect to their inquiry techniques. We have therefore incorporated a feedback mechanism into the training program.

Each session is tape-recorded. At the end of the session or the beginning of the next one, the tape is played back to the group. The teacher evaluates each question, or series of questions, with the group in terms of its structural and strategic properties. The children learn why the question was useful or how it could have been given more precision or control. This "Monday morning quarterbacking" has been very useful in drawing the children's attention to the importance of *process*, something which children typically ignore because of their great interest in the *content*. We are able to show the children quite graphically, by using the tapes, just how the variables of process affect the productivity of discovery.

THE EFFECTS OF INQUIRY TRAINING

We have developed a set of instruments for the analysis of a person's inquiry process and for the measurement of his productivity of discovery, both in scope and depth. This is done by sampling his inquiry in attempting to find an explanation for a filmed demonstration. The session is tape-recorded and typescripts are coded and scored for several process variables including fluency, control, precision, and autonomy.

Following the question-asking session, the subject is given a paper and pencil test designed to measure (a) what principles he has discovered through the inquiry; (b) which of the necessary conditions he could identify and how accurately he could identify them; and (c) how many objects, conditions, and events of the episode he had positively identified or correctly assumed.

At present there are 12 groups of sixth-grade children in 12 school systems who are currently undergoing 24 weeks of Inquiry Training. Their teachers attended an eight-week workshop conducted by our project at the University of Illinois during the summer of 1960. These children, along with control groups in the same schools, will be tested with the above instruments when the 24 weeks of Inquiry Training are completed. This will provide concrete evidence on a scale large enough to draw specific conclusions regarding the effects of prolonged Inquiry Training in the school setting.

For the present we must examine the protocols from one of our later pilot studies and speculate somewhat subjectively as to what happened to 10 fifth-graders in 15 weeks of training. Steve is typical of the group. His early weaknesses were similar to those characterized in a previous section of this article. Probably because of his high intelligence [2] and interest in

[2] Steve's score on the California Test of Mental Maturity was at the 99th percentile.

science he responded somewhat better than average to the training program. Here is a sample from one of his protocols obtained after 15 hours of Inquiry Training. The film, once again, is "The Bimetallic Strip":

Steve: Was this plain water in the tank?
Examiner: Yes.
Steve: Was this a special kind of a flame?
Examiner: No.
Steve: If you had used a wood flame would it work?
Examiner: Yes.
Steve: Was the blade hot when the film was going on?
Examiner: When it was being heated, certainly.
Steve: Did it melt?
Examiner: No.
Steve: I have a hypotheses. Wait a minute I'd better start testing before I give it. Could this be done in a vacuum?
Examiner: Yes.
Steve: If this had been left to set for five days would it work?
Examiner: Yes.
Steve: Could this have been made—was this made any different way than any other knife you would think it would be like?
Examiner: Yes.
Steve: Did that have any effect on it?
Examiner: Surely.
Steve: Was there some chemical in the metal that did it?
Examiner: No.
Steve: Had this thing been dipped before it hit the water?
Examiner: No.
Steve: Had it been heated before? Was it heated the second time?
Examiner: Yes, many times.
Steve: Could you have done it without heating it once?
Examiner: Yes.
Steve: Could you keep on heating this and the knife would keep bending?
Examiner: Yes.
Steve: Would it ever break from going up and down?
Examiner: No, not from that—not from going up and down.
Steve: Did the water have anything to do with it bending the second time?
Examiner: Find out.
Steve: If you had put this thing over a cold vent of air would the thing have gone back down?
Examiner: Yes.
Steve: Was the water in the thing cold?
Examiner: Yes.
Steve: Would the same thing happen if it was hot?
Examiner: If what were hot?
Steve: The water—to the boiling point.
Examiner: No.

Steve: It would stay the same?
Examiner: Probably.
Steve: If she had just dipped it down—if it was a shorter knife and she just dipped it down so it didn't touch anything but the water would it straighten out?
Examiner: Yes.
Steve: Could I have bent it—as I am now, no stronger or no weaker, could I have bent that metal?
Examiner: Oh, sure.
Steve: Was it aluminum?
Examiner: No.
Steve: Steel?
Examiner: No.
Steve: Was it made of the same substance that these knives are made of—regular table knives?
Examiner: No.
Steve: Was it made out of asbestos?
Examiner: No.
Steve: If she had let it cool—just let it cool down to room temperature would the thing straighten back?
Examiner: Yes.

Steve discovered within the allotted time that having two different metals fused together was a necessary condition and that differential expansion was also necessary. That is a significant accomplishment for a fifth-grader. His inquiry techniques, although much improved over his attempts before training, still fell short of the performance standards we had hoped to develop. However, his fluency count was high; his questions were clear, direct and reasonably well controlled; his early verifications, though not particularly complete or systematic, did garner him some critical data.

Episode analysis properly gave way generally to the determination of relevance and the induction and testing of relational constructs. Steve's problem was typical of bright children who have a fairly rich science background. He was in too much of a hurry to be "right." He plunged too soon into the strategy of hypothesis testing (Bruner's "successive scanning"). Fortunately for Steve, his past experience led him intuitively to enough good hunches to make this strategy profitable. But in the long run, with more complex and unfamiliar problems, Steve will be more successful using a more systematic and conservative approach that makes greater use of episode analysis.

Each subject had his own strengths and weaknesses of inquiry process when he began and each developed through training in his own way. However, there were certain rather prevalent trends that marked the changes that we could observe over the fifteen week period. One of the most dramatic changes was in the productivity of questions. The number of questions asked increased with each week of training. As the children learned

how to use the schema they overcame their initial blocking and found that they could design sequences of related ` questions with increasing ease. Having a plan of operation with specific goals in mind is far more productive than dreaming up a series of unrelated and uncoordinated probes.

Questions also became more precise and controlled. The children learn quickly that vague and confused questions cannot elicit answers that are clear. They learned, for example, that in verifying the condition (let us say temperature) of an object in an experiment, they had to take the time dimension into consideration and specify "when." If a child, in reference to the bimetallic strip, asked if the strip were the same temperature as the water, the question *could* be answered "yes," because at certain times during the demonstration they were the same temperature. After a few encounters with the difficulties caused by poorly controlled questions, children usually mended their ways and increased their precision and control markedly.

Another shift was in the kinds of questions asked. At first the children used questions mainly for verification and identification (e.g., Is that a knife? Is that water?) There was also a lot of broad questioning about relevancies. (Does it have anything to do with heating the blade?) While these do help to narrow the field of focus, they do not bring the child within range of the explanation. Sooner or later the children learned to isolate and measure such variables as length, temperature, and weight conditions at various times during the demonstration and to note correspondences among sets of them. Eventually they could induce relational constructs to account for the correspondences and test these with critical experiments.

A change in attitude came over the children as training progressed. Their increasing willingness to pursue difficult problems for long periods without a "breakthrough" suggested to us that they were developing faith in the regularity of the physical world, and becoming less tolerant of apparent exceptions to the principles that they knew. They found themselves discovering workable rules and generalizations that permitted them to predict and control physical events with increasing speed and accuracy. In their mounting enthusiasm for each new problem we believed that we could recognize a growing sense of intellectual power—a feeling of self-confidence and excitement that motivated continued inquiry far more than the usual extrinsic classroom rewards possibly could.

Not all children benefit equally from Inquiry Training; intelligence and creativity do not always work wholly in a child's favor. While gifted children are certainly the best equipped to make use of the new approach, they are often the least willing to adhere to it. To begin with, they are rarely concerned with the *process* of inquiry. They are looking for immediate closure in the form of explanations and understanding. In the case of the metal strip they want to know why it bent and why it straightened out. Gifted fifth- and sixth-graders are likely to have fairly well-developed (although

not necessarily accurate) conceptual systems regarding such things as the properties of metals and the effects of heat on objects. They are likely to bring these to bear in the formulation of hypotheses without first taking the time or effort to verify events or identify objects. They have so often been successful in taking the "big leap" that they have no patience with the somewhat less exciting procedure of systematic data-gathering. We have found, however, that in time and with enough training even the most "leapy" gifted children recognize the value of *episode analysis* and employ it with regularity.

It is not our purpose to discourage "leapy-ness." One of the advantages that many gifted children have is the confidence to go out on a limb and formulate hypotheses. But discovery does not spring full blown from the depths of the creative mind. Even the most gifted child must have empirical evidence to work with.

INQUIRY TRAINING AND THE CURRICULUM

We do not suggest that inquiry or discovery should replace good, didactic exposition. If a child had to discover every new relationship for himself, a great deal of time and energy would be wasted. Gifted children in particular are capable of acquiring elaborate conceptual systems through explanations and demonstrations. But more basic than the attainment of concepts is the ability to inquire and discover these autonomously. Inquiry Training is not proposed as a new way to teach science, but as a way of teaching basic cognitive skills that are just as important to the intellectual development of the child as reading and arithmetic. It belongs in the science program and in every other curriculum area that requires the performance of empirical operations, inductive and deductive reasoning, and the formulation and testing of hypotheses.

However, it is not realistic to think of Inquiry Training as a special kind of teaching apart from the rest of the curriculum content. Discovery may have no meaning and no importance to the child unless something of value is discovered. The child cannot be expected to see a purpose in searching for the physical relationships that govern the bimetallic strip unless these relationships seem important and useful to him, unless they help him to understand other physical events and to see the "hidden likenesses" among seemingly dissimilar phenomena.

When our subjects see that metal strip bend upward it troubles most of them. Metal just doesn't *do* things like that! It is important to the child that he understand why. He wants to be able to predict and control events in his environment and he will go to great lengths to obtain the conceptual growth that is necessary to do this. This, we believe, is why our subjects are so well motivated. Inquiry will not occur in a vacuum. The autonomous attainment of new meaning and comprehension—the unification of diverse

experiences through the discovery of principles and generalization—this is what inquiry holds for those who learn to use it productively.

REFERENCES

1. BEBERMAN, M. *An emerging program of secondary school mathematics.* Cambridge: Harvard Univ~ ~ity Press, 1958.

2. BRUNER, J. S., GOODNOW, , _QUELINE, J., and AUSTIN, G. A. *A study of thinking.* New York: Wiley, 1956.

3. BRUNER, J. S. *The act of discovery.* A paper read at the sixteenth annual meeting of the Phil. of Educ. Soc., April, 1960.

4. BRUNER, J. S. *The process of education.* Cambridge: Harvard University Press, 1960.

5. DEWEY, J. *How we think.* Boston: Heath, 1910.

6. FINLAY, G. Secondary school physics: The Physical Science Study Committee. *Amer. J. of Physics,* 1960, **28**, 286-293.

7. HENDRIX, GERTRUDE. Learning by discovery. *Mathematics Teacher,* 1961, **54**, 290-299.

8. INHELDER, BÄRBEL, and PIAGET, J. *The growth of logical thinking.* New York: Basic Books, 1958.

9. KARPLUS, R. Personal communication. March, 1961.

10. MOORE, O. K. Orthographic symbols and the preschool child—a new approach. A paper read at the third Minnesota Conf. on Gifted Children, Minneapolis, October, 1960.

11. SCHAFTEL, FANNIE R., CRABTREE, CHARLOTTE, and RUSHWORTH, VIVIAN. *Problem solving in the elementary school.* School of Education, Stanford University. (Hectograph)

12. SUCHMAN, J. R. Inquiry training: teaching children the skills and strategies of productive thinking in science. A paper read at the meeting of the Amer. Psychol. Assn., Chicago, September, 1960.

13. SUCHMAN, J. R. Inquiry training in the elementary school. *Sci. Teacher,* 1960, **27**(7), 42-47.

14. WERTHEIMER, M. *Productive thinking.* New York: Harper, 1945.

15. WHITE, R. W. Motivation reconsidered: the concept of competence. *Psychol. Rev.,* 1959, **66**, 297-333.

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FACTORS AFFECTING CREATIVE THINKING IN CHILDREN: AN INTERIM RESEARCH REPORT [1]

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The author and his associates have just completed the second year of a continuing series of studies to investigate the factors affecting the development of the creative thinking abilities in children. Exploratory studies have already been made of the effects of a variety of factors hypothesized to affect the development of these abilities. Some of these have been factors in nature and society; others have been variables which have been manipulated experimentally in the laboratory and/or the classroom.

Of the factors in nature and society, these studies (8, 9, 10) thus far indicate that the following factors affect the development and/or expression of creative thinking:

1. Educational level
2. Differential treatment of boys and girls
3. Premature attempts to eliminate fantasy
4. Restrictions on manipulativeness and curiosity
5. Conditions resulting in fear and timidity, in both authority and peer relations
6. Misplaced emphasis on certain verbal skills, especially on mechanics
7. Overemphasis on prevention and on "success"
8. Lack of resources for working out ideas.

Although the results of some of the laboratory and field experiments are not yet available, preliminary analyses indicate that the following experimentally manipulated variables affect significantly the production of ideas or functioning of the creative thinking abilities (9):

1. The composition of the group in which the thinking takes place (homogeneous or heterogeneous) (12)
2. Competition (9)
3. The teaching of principles for thinking up ideas (e.g., in product improvement tasks, the well known Osborn principles of combining, adding to, and the like) (9)
4. The nature of the "warm-up," instructions (quantity vs. quality), and practice (unevaluated vs. evaluated practice) (12)

5. Rewarding creative thinking (treating questions with respect, treating imaginative ideas with respect, encouraging and evaluating self-initiated learning, etc.) (12)

6. Activities which help children to value their own ideas (e.g., encouraging the "idea-trap" habit) (12)

Consideration has been given to many other factors and doubtless there are still others that have not yet been studied. These happen to be the ones about which the most data have been developed. Only educational level and sex will be considered in this paper.

MEASURING THE CREATIVE THINKING ABILITIES

Before presenting some of our results concerning the effects of educational level and sex, it will be necessary to give you some idea concerning the tasks used to measure the creative thinking abilities.

At first, we felt that our best bet would be to adapt for use with children some of the tasks used by Guilford(2). Accordingly, we developed two alternate forms of the following tasks adapted from Guilford: Unusual Uses, Impossibilities, Consequences, Problem Situations, Improvements, and Problems.

Almost simultaneously we began experimenting with several other types of materials suggested by analyses of the reported experiences of eminent scientific discoverers, inventors, creative writers, and the like. One of these, called the Ask-and-Guess Test(13), requires the child first to ask questions about a picture, questions which cannot be answered by looking at the picture. Next he is asked to make guesses or formulate hypotheses about the causes and consequences of the behavior shown in the picture. In the Product Improvement Test we have used common toys and asked children to think of improvements which would make them more fun to play with. We also asked them to think of unusual uses of these toys other than as something to play with. A Problem Situations Test somewhat different from Guilford's was devised. For example, one such task requires the subject to think of all the possible things Mother Hubbard could have done when she found no bones in the cupboard.

Various non-verbal tasks have been developed. One of these is an adaptation of Frank Barron's (1) Picture-Completion Test. Another is the Circles and Squares Test. In one form, the subject is confronted with a page of circles and asked to sketch objects which have as a major part a circle; in the alternate form, squares are used. The Shape Test requires the subject to create a picture, using as the base stimulus standardized shapes of colored paper. The instructions stress originality and elaboration.

From these tasks, scores have been developed for such factors as the following: verbal fluency, non-verbal fluency, spontaneous flexibility, originality, inventiveness, constructiveness, elaboration, curiosity, hypothesis formation (causes and consequences), and the like. This approach differs

from Guilford's in that he stresses the desirability of factorial purity in the tasks, whereas this author has calculatedly used fairly complex tasks involving two or more types of thinking. Then an attempt is made to assess the resulting products in terms of the kinds of thinking evidenced. Factor analyses now in process will guide future development of the measures.

The coefficients of correlation between the measures derived from these tasks and performance on traditional tests of intelligence are quite low and frequently not significant. Computations of product-moment coefficients have been made within grades and separately for different measures of IQ. With the Stanford-Binet in a university laboratory elementary school, we obtained a mean coefficient of correlation of .17; with the Lorge-Thorndike, a mean of .27 in the laboratory high school. In a parochial elementary school, using the Kuhlman-Finch, a mean of .26 was obtained; in a public elementary school in Minneapolis, using the California Test of Mental Maturity, a mean of .24 resulted; in a small-town elementary school, using the Otis Quick-Scoring Test of Mental Ability, a mean of .32 was obtained. In a class of gifted elementary school children at the intermediate level a coefficient of correlation of .03 was obtained. In a sample of 70 counselor trainees in the graduate school, a coefficient of .10 was obtained between the measure of creativity and scores on the Ohio Psychological Examination and −.02 with scores on the Miller Analogies. Whatever the measure of intelligence used, we would miss about 67 per cent of the upper 20 per cent on creativity if we were to rely upon the IQ metric alone for selecting the top 20 per cent as a gifted group for any purpose.

These results are similar to those reported by Hargreaves in 1927(3) for his tests of imagination. He found statistically significant relationships with tests of intelligence when he scored his tests for fluency but not when he scored them for originality.

The author and his associates are continually working with problems of reliability and validity. Reliability in scoring has been kept consistently above .90 among raters through the use of detailed scoring guides and training of raters. As data from longitudinal studies and from pre- and post-tests in field experiments accumulate, more meaningful indexes of reliability can be established. Concerning validity, first efforts have been made to ground the tasks theoretically in what is known about the creative process. As intermediate criteria of validity, teacher and peer nominations have been used and the results have been promising. Children who scored high on the tests of creative thinking initiated more ideas than their peers in standardized tasks requiring creative thinking. Department store saleswomen who ranked in the upper third in volume of sales scored significantly higher than those who ranked in the lower third in sales. Also, saleswomen who worked in departments rated by the personnel director as requiring creativity scored significantly higher than those working in other departments. Other evidences of validity are being collected on a continuing basis.

DEVELOPMENTAL CURVES BY EDUCATIONAL LEVEL

Provisional developmental curves have been established for the various factors which have been assessed. Educational level has thus far been used as the basis for these curves. Each curve is based on from 70 to 200 cases at each educational level, grades one through twelve. In the first three grades, the verbal tasks were administered orally and individually. All others were required to write theirs. Since having to write down one's ideas is inhibiting to some individuals, the tasks were administered orally and individually to two fourth-grade classes. Although interesting individual differences were found, the oral administration did not change the shape of the developmental curves obtained.

The general pattern of most of the developmental curves runs something like this: There is a steady increase from the first through the third
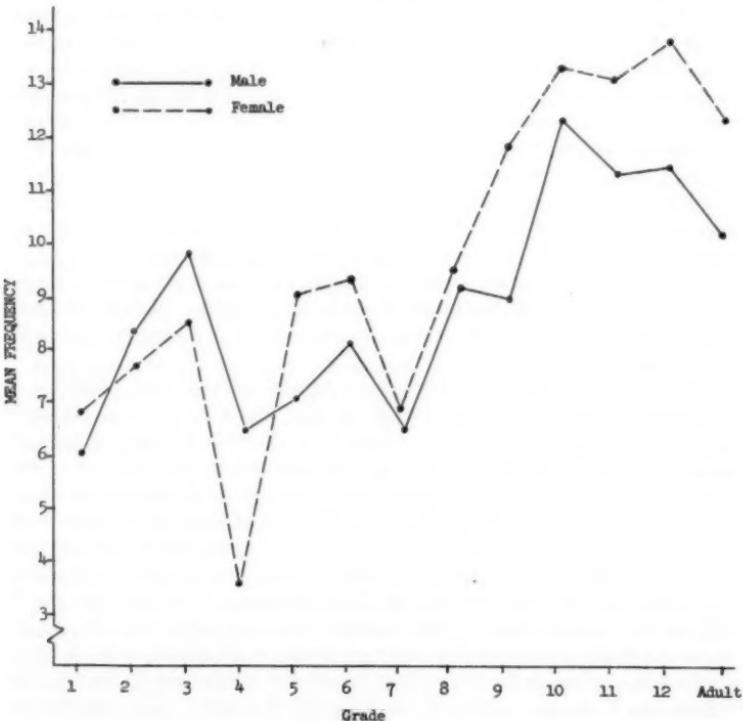
Fig. 1. Developmental curve for the mean frequency of questions asked on Part I, ASK, of ASK-AND-GUESS TEST.

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grade. With one exception, there is a sharp decrease between the third and fourth grades followed by recovery in the fifth and sixth grades. The developmental curve shown in Figure 1 based on the mean number of questions asked on Part I of the Ask-and-Guess Test is quite typical except for the formulation of hypotheses concerning causation shown in Figure 2. This type of thinking seems to develop slowly but gradually and there is no dip between the third and fourth grades. Instead, there is a healthy increase between the third and fourth grades.

It is also interesting to study the developmental characteristics of the types of questions asked in Part I of the Ask-and-Guess Test. As will be
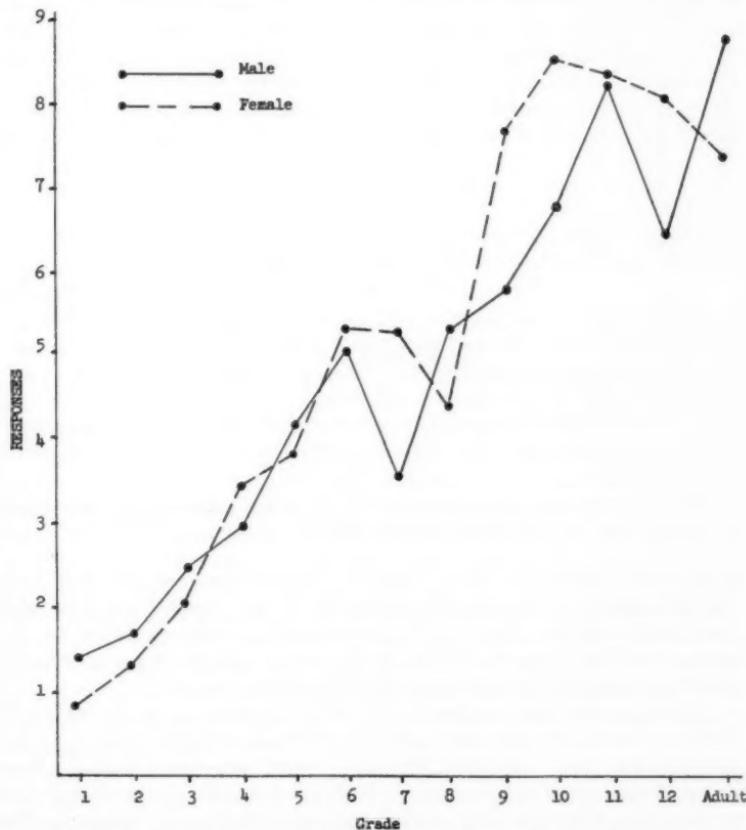
Fig. 2. Provisional Growth Curves for Ability to Form Hypotheses Concerning Causation.

noted from Figure 3(16), more than 70 per cent of the questions asked
by the first, second, and third graders are "Why" questions. As we go up
the educational ladder, the frequency of "Why" questions diminishes be-
tween the third and fourth grades and then settles down at about one-third
of the total number of questions asked. The frequency of "What" and "Be"
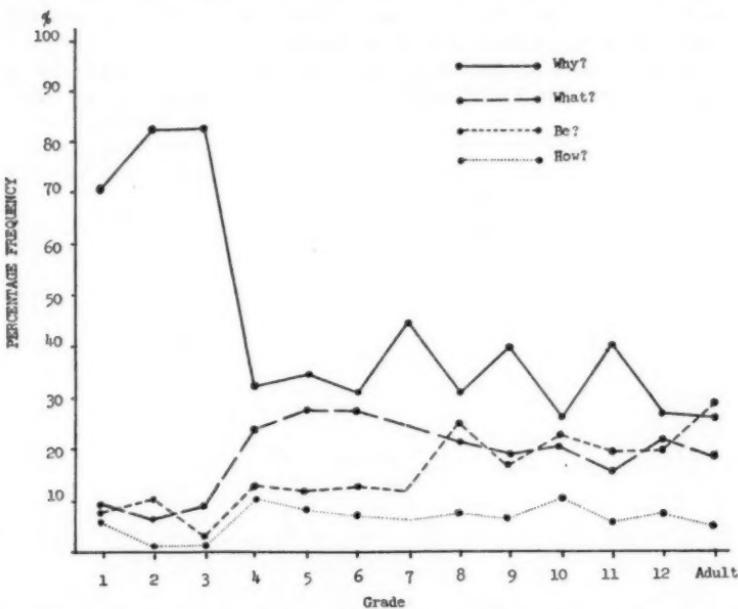
Fig. 3. Frequency percentage curves of various types of questions asked
on Part I, ASK, of ASK-AND-GUESS TEST.

questions increases and there appears a general tendency to shift from
"global" questions through the "specific" to the "definitive." It is also
interesting that the characteristic developmental features found in the
spontaneous questions of children by Piaget(6) and others are also found
under our testing conditions when we "ask children to ask."

Many possible explanations for the sharp decrease in the fourth grade
have been advanced and a new series of studies designed to investigate this
problem has been launched. For many years, occasional students have
called attention to these phenomena. Kirkpatrick in 1900(4) presented data
to show that there is a drop in the imaginative abilities of children in the
fourth grade and that it continues through the fifth and sixth. With his
ink-spot task, he found increases again in the seventh and eighth grades.

Simpson in 1922(7), however, reported phenomena almost identical to those reported by the author and his associates. Following a peak in the second half of the third grade, he found a sharp decrement by the beginning of the fourth, followed by a plateau in the latter part of the fourth and fifth. A new peak is reached during the second half of the sixth, followed by decrements in the seventh continuing into the beginning of the eighth. The slow but continuous growth of ability to formulate hypotheses concerning causation has been documented by Piaget(6), Vernon(14) and others.

Some investigators(15) regard this slump as more or less inevitable, maintaining that the most teachers and parents can do is to "keep open the gates for its return." Others(5) maintain that this "loss of creativity" can be offset at any period in the life-cycle through creative teaching or supervision. It is not known whether or not similar phenomena will be found in cultures outside the United States or even in subcultures within the United States. Developmental data are now being collected in several other cultures and subcultures.

SEX

The differential treatment of boys and girls in our culture apparently produces interesting and significant differences in the ways boys and girls develop their creative thinking abilities.

From first through third grade, boys become increasingly superior to girls in almost all of the creative thinking abilities for which the author and his associates have devised measures. By the fourth grade, however, boys apparently begin losing their battle against conformity to behavioral norms and show a sharp measured decrement in most of these abilities.

These differences in favor of boys emerge even when stimuli inappropriate to the sex role of boys are used. For example, in one experiment(10) three toys were used: a nurse's kit, a fire truck, and a dog. At the first-grade level, girls produced more ideas than boys for improving the nurse's kit so that it would be "more fun to play with." Some of the boys stubbornly refused to think up any ideas for improving the nurse's kit, while others first changed it to a doctor's kit and then suggested improvements. Boys produced more ideas than girls for improving the fire truck and there was scant difference between boys and girls on the dog task. By the third grade, however, boys were clearly superior to girls on this task, both in the quantity and quality (flexibility, constructiveness, originality, etc.) of their ideas for improving all of the toys, including the nurse's kit.

One clue to the superiority of boys over girls on tasks of this kind is the greater manipulativeness of boys. It was found(10) that the degree of manipulation exhibited during the test is related to the number and quality of the ideas produced. This tendency to manipulate, to explore, to experiment, appears also to be involved in invention and scientific discovery.

The superiority of boys over girls was also shown in a group task involving experimentation with science toys(10). Each group, composed of five members (two boys and three girls or vice versa), was confronted with the task of discovering in the first thirty minutes how many things these toys could be made to do and then in a second thirty-minute period to demonstrate and explain their discoveries. At almost every grade level from second through sixth boys demonstrated and explained more principles than girls. At the fifth-grade level, girls initiated as many ideas as boys but explained significantly fewer principles than the boys.

At the same time that boys are becoming increasingly more inventive and curious between the first and third grades, peer pressures against boys with clever and original ideas are increasing. Girls appear to learn earlier than boys how to gain peer acceptance of their ideas and to avoid being labeled as having "silly" or "wild" ideas. For example, highly creative boys received about four times as many peer nominations as girls on such criteria as: "Who in your class has the most silly or wild ideas? Who in your class has the most ideas for being naughty?" Highly creative boys also tend to have a reputation among their teachers for having "a lot of wild ideas" but highly creative girls do not gain such a reputation. This opinion may stem from the fact that highly creative boys exhibit more uniqueness, inventiveness, and originality in their drawings and other productions than do highly creative girls. Highly creative boys compared with highly creative girls also tend to be less accessible psychologically and to have more internal tension.

In spite of the fact that it is known that our society treats boys and girls differently concerning their creative desires, many will argue that some of the differences described herein have some kind of physiological basis. One recent study indicates that some of these trends can be changed.

In a study(11) just completed it seems clear that the reactions of fourth-, fifth- and sixth-grade girls in one school studied to tasks requiring creative scientific thinking changed in significant and important ways during the period from April 1959 to May 1960. In 1959, boys demonstrated more ideas and explained more scientific principles than did girls. In fact, they demonstrated and explained over twice as many. In 1960, girls in these same classes demonstrated and explained just as many principles as did boys. In 1959, many girls expressed obvious distaste for the science-toy task and tended to withdraw from active participation in it. In 1960, none of this dislike was observed. In fact, girls reported as much enjoyment of the task as boys did.

One aspect of the situation, however, has not changed. The contribution of boys to the success of the group continues to be evaluated more highly than that of girls. There is also a slight and almost significant trend for boys to evaluate their own contributions to the success of the group more highly than do girls. In other words, cultural changes appear to be making it more permissible for girls to participate in and enjoy tasks re-

quiring scientific thinking, but the contributions of boys are still more highly valued by peers than are those of girls.

CONCLUSIONS

The results presented in this interim report should be regarded as tentative. It is interesting to find, however, that pioneer studies around the turn of the century and in the 1920's are in essential agreement. Developmental curves are now being developed for larger samples, additional thinking abilities, and additional cultures and subcultures. The factorial structure of the measures being developed are also under investigation. Major emphasis, however, has been given to the manipulation of variables hypothesized to affect the quantity and quality of the creative thinking of children.

REFERENCES

1. BARRON, F. The psychology of imagination. *Scien. Amer.*, 1958, 199, 151-166.

2. GUILFORD, J. P., WILSON, R. C., CHRISTENSEN, P.C., and LEWIS, D. J. A *factor-analytic study of creative thinking. I. Hypotheses and description of tests.* Los Angeles: Univer. of Southern Calif., 1951.

3. HARGREAVES, H. L. The faculty of imagination. *Brit. J. Psychol.* (Monograph Supplement), 1927, Vol. 3, No. 10.

4. KIRKPATRICK, E. A. Individual tests of school children. *Psychol. Rev.*, 1900, 5, 274.

5. MEARNS, H. *Creative power.* New York: Dover Pub., 1958.

6. PIAGET, J. *The language and thought of the child.* New York: Meridian Books, 1957.

7. SIMPSON, R. M. Creative imagination. *Amer. J. Psychol.*, 1922, 33, 234-243.

8. TORRANCE, E. P. Current research on the nature of creative talent. *J. counsel. Psychol.*, 1959, 6, 309-316.

9. TORRANCE, E. P. Explorations in creative thinking in the early school years: A progress report. In Taylor, C. W. (Ed.) *The third University of Utah research conference on the identification of creative scientific talent.* Salt Lake City: Univer. of Utah Press, 1959.

10. TORRANCE, E. P. (Ed.) *Creativity: Proceedings of second Minnesota conference on education of the gifted.* Minneapolis: Center for Continuation Study, Univer. of Minn., 1960.

11. TORRANCE, E. P. *Explorations in creative thinking in the early school years: XI. Changing reactions of girls in grades four through six to tasks requiring creative scientific thinking.* Minneapolis: Bureau of Education Research, 1960.

12. TORRANCE, E. P. (Ed.) *New ideas: Proceedings of third Minnesota conference on education of gifted children.* Minneapolis: Center for Continuation Study, Univer. of Minn., in press.

13. TORRANCE, E. P. and RADIG, H. J. *The Ask-and-Guess Test: Scoring manual and rationale.* Minneapolis: Bureau of Educational Research, Univer. of Minn., 1959.

14. VERNON, M. D. The development of imaginative construction in children. *Brit. J. Psychol.*, 1948, 39, 102-111.

15. WILT, E. *Creativity in the elementary school.* New York: Appleton-Century-Crofts, 1959.

16. YAMAMOTO, K. *Further analysis of Ask-and-Guess Test results.* Minneapolis: Bureau of Educational Research, Univer. of Minn., 1960.

ORAL DEPENDENCY IN ANXIOUS AND DEFENSIVE CHILDREN [1]

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The present paper reports the results of part of an extensive study of personality and intellectual variables of anxious and defensive children. Specifically, the paper presents evidence relevant to the hypothesis that dependency needs play a prominent role in the personality dynamics of both highly anxious and highly defensive children. Sarason, Davidson, Lighthall, Waite, and Ruebush[5] present evidence that conflicts involving dependency needs constitute *one* of the important determinants of high anxiety in children. It is here postulated that conflicts involving dependency needs also play a prominent role in the personality dynamics of highly defensive children. This is consistent with the position set forth by Freud[2] and Anna Freud[1] and involves several assumptions.

The first assumption is that anxiety plays an important role in the personality dynamics of *both* highly defensive and highly anxious children. It is recognized that the role played by anxiety in the dynamics of the defensive child may take either of two forms — although no attempt is made in the present study to differentiate between them: (a) The defensive child, although not experiencing anxiety consciously, may be subject to a strong unconscious predisposition to anxiety underlying strong unconscious defenses,[3] or, (b), He may actually experience high anxiety but consciously deny the experience.

[3] When Freud uses the term "anxiety" in this connection, he is not referring to anxiety itself but rather to an "unconscious readiness" to develop the affect of anxiety. This is what he has in mind when he speaks of anxiety as an "unconscious affect" (Freud, 1925). Thus, for example, we are really referring to an unconscious "readiness" or "potential disposition" when we use anxiety as an intervening variable in predicting that the removal of a certain symptom or defense will be followed by an unusually strong anxiety reaction.

It is further assumed that the unconscious predisposition to anxiety or consciously denied anxiety of highly defensive children is based on etiological factors similar to those underlying the anxiety admitted by highly anxious children. In addition, it is assumed that highly anxious and highly defensive children differ mainly in the types of defenses they employ. In other words, these assumptions state that: (a) Extreme defensiveness is indicative of the presence of anxiety, or the presence of a strong predisposition to anxiety, which is kept in check by strong defenses; (b) Extreme defensiveness and intense anxiety are indicative of the presence of similar kinds of conflicts including those involving dependency needs; and, (c), Different ways of defending against conflicts and anxiety constitute the fundamental difference between the two groups. A major theme of the present paper is that one of the expected consequents of the difference in the defenses of anxious and defensive children is that dependency needs should be manifested in a more indirect or censored manner in the behavior of highly defensive children.

In line with this reasoning, predictions were made concerning the expected differential performance of anxious and non-anxious children, and defensive and non-defensive children, on two different measures of oral dependency obtained from inkblot responses. These responses were judged as indicating either direct oral dependent (receptive) imagery or behavior, or indirect oral dependent imagery, or as not suggestive of oral dependency. The first prediction was that pervasive, direct oral receptive imagery and dependent behavior would be found to a reliably greater extent in the inkblot responses of high-anxious—low-defensive children than in the responses of low-anxious—low-defensive children, while on the contrary no reliable differences in the number of responses reflecting indirect oral dependency would be found between these two groups. The second prediction was that percepts indirectly reflecting an oral dependent orientation would be found to a reliably greater extent in the inkblot responses of high-defensive—low-anxious children than in the responses of low-defensive—low-anxious children, while on the contrary no reliable differences in the number of responses reflecting direct oral dependency would be found between these two groups.

METHOD

Anxiety and Defensiveness Scales

The study employed the Test Anxiety Scale for Children as the measure of anxiety, and the Defensiveness Scale for Children as the measure of defensiveness. The Test Anxiety Scale, with evidence as to its reliability and validity, has been published in a recent monograph (Sarason et al.[5]). The Defensiveness Scale for Children was employed for the first time in the present study. It is composed of a series of Lie Scale items, (e.g., "Has

anybody ever been able to scare you?"), which were previously embedded within the General Anxiety Scale for Children, plus a series of items designed to measure the tendency to deny the expression of negative feelings. These include questions such as: "Do you feel cross and grouchy sometimes?", "Are there some people that you don't like?", or, "When someone scolds you does it make you feel badly?" The reliability coefficient for the scale, obtained by use of Hoyt's Internal Consistency Method(4), was .82.

Subjects

The original sampling population from which the children in this study were selected was the entire fourth grade of the 11 elementary schools of Hamden, Connecticut (261 boys and 253 girls). This population received the Test Anxiety Scale for Children, the Defensiveness Scale, and the Lorge-Thorndike Intelligence Test (Level 2, Form B). The first step in selecting the final sample of 72 children was to drop all children whose Lorge-Thorndike IQ scores were below 99 or above 112 from the sampling pool. The second step was to select sampling populations of boys and girls from the remaining children who were high-anxious—low-defensive, low-anxious—low-defensive, and low-anxious—high-defensive. The following procedure was employed in selecting these populations: First, boys and girls whose test anxiety scores and defensiveness scores were both below approximately the 45th percentile point were designated low-anxious—low-defensive (LA-LD). Second, boys and girls whose test anxiety scores were above approximately the 85th percentile point and whose defensiveness scores were below approximately the 45th percentile point were termed high-anxious—low-defensive (HA-LD). Third, boys and girls whose test anxiety scores were below approximately the 45th percentile point and whose defensiveness scores were above approximately the 85th percentile point were termed low-anxious—high-defensive (LA-HD). The determining factor in arriving at these particular cutoff points was the need to select groups which differed significantly on the relevant variables while at the same time insuring an adequate number of Ss in each group so that random sampling procedures could be utilized.

Finally, 12 boys and 12 girls were randomly selected from each of these three populations. The final sample, therefore, consisted of six groups of 12 Ss each: HA-LD boys, LA-LD boys, LA-HD boys, HA-LD girls, LA-LD girls, and LA-HD girls. Each of these six groups had mean IQ scores of approximately 106.

Research Design

For purposes of statistical analysis the six groups were arranged in a research design composed of two 2 x 2 factorial designs. Design I was a 2 (Sex) x 2 (Test Anxiety) factorial design with defensiveness controlled by including only low defensive Ss. There were four groups in this design:

HA boys, HA girls, LA boys, and LA girls. Design II was a 2 (Sex) x 2 (Defensiveness) factorial design with test anxiety controlled by including only LA Ss. There were also four groups in this design: HD boys, HD girls, LD boys, and LD girls. An economical feature of the study was that two of the cells in both factorial arrangements contained the same Ss, the low-anxious—low-defensive boys and girls occupying two cells in each design.

Criterion Task and Procedure

The criterion task was the Holtzman Inkblot Test, Form B(3). This test consists of a series of 45 inkblot plates. One response is allowed for each card. A standard inquiry is obtained after each response. E, who did not know the anxiety or defensiveness level of the Ss, administered the criterion task to the 72 Ss individually in the public schools.

Scoring

Schafer(6) was used as a guide in the construction of rating scales for direct and indirect oral dependency. Inkblot raters who did not know the anxiety or defensiveness level of any of the Ss scored each inkblot response as either (a) direct oral dependent (receptive) imagery or behavior, (b) indirect oral dependent imagery, or (c) not suggestive of oral dependency. No inkblot response was scored as reflecting both direct and indirect oral dependency, and numerous concrete examples of each category were included in both rating scales in order to facilitate reliable scoring. The inter-scorer reliability coefficients (Pearson product moment correlation coefficients) for the two scales were .87 and .89 respectively.

Direct Oral Dependency Scale. Score references to any of the following categories as direct oral dependent imagery were:

1. Obviously infantile or dependent-referent percepts (e.g., puppets, fairies, elves, dolls, nests).
2. Obvious food and eating responses (e.g., groceries, carrots, eggs, restaurant, cow, pig, ice cream, jelly).
3. Food references which are only slightly ambiguous (e.g., chicken, ice-cubes, pumpkin with face).
4. References to supply in the general sense (e.g., bundles, reaching for food, party).
5. References to gifts (e.g., Christmas, birthday party, present).
6. References to dependent need (e.g., drowning, greeting, longing).
7. Strong dependent or oral activity (e.g., "yelling" for help, holding breath, kissing).
8. References to orally-related anatomy (e.g., stomach).
9. Questions addressed to the examiner or requests for aid in making the response.

Indirect Oral Dependency Scale. Score references to any of the following categories as indirect oral dependent imagery:

1. The mouth, except where oral aggressive imagery is indicated specifically (e.g., teeth).

2. Oral activities not directly related to intake (e.g., blowing horn).

3. Ambiguous food and food-related responses (e.g., fish, pasture, fly).

4. References to potential food containers (e.g., bottle, cupboard, bowl).

5. Deprivation and decay responses (e.g., desert, cactus, rotten).

6. References with protective implications (e.g., house, cave, policeman, harbor, fence, castle).

7. References to size (e.g., big, little, fat, thin).

8. References to support, balance and dependence (e.g., legs, hangers, separation).

9. References to toys not obviously infantile in nature (e.g., plastic horse).

10. References to earlier childhood years.

RESULTS

Design I

It will be recalled that the Ss composing the four groups in Design I were high-and-low-anxious boys and girls who were not defensive on the defensiveness scale. Group means and the analysis of variance summary table for the direct oral dependency scores of these Ss are given in Table 1. The analysis of variance of direct oral dependency scores for these Ss yielded a statistically significant Anxiety X Sex interaction effect ($p < .05$). This interaction resulted from the fact that the mean direct oral dependency score of HA boys was higher than that of LA boys, whereas the mean score

TABLE 1

DESIGN I: ANALYSIS OF VARIANCE AND GROUP MEANS OF
DIRECT ORAL DEPENDENCY SCORES

Source	df	MS	F	P
Anxiety	1	25.00	1.39	
Sex	1	6.65	0.37	
Anxiety X Sex	1	74.55	4.15	$p < .05$
Total between groups	(3)			
Error (within)	(44)	17.96		
Total	(47)			

N = 12	HTA(boy)	HTA(girl)	LTA(boy)	LTA(girl)
Group Means	9.52	6.29	5.59	7.34

of HA girls was lower than that of LA girls. Thus, the difference between the mean scores of boys was in the predicted direction, whereas the direction of the difference between female means was opposite from that formally predicted. The results of t-tests, however, revealed that whereas the mean direct oral dependency score of HA boys was significantly higher than that of LA boys ($p < .05$, two-tail test), the difference between the mean scores of LA and HA girls was not reliable. Group means and the analysis of variance summary table for the indirect oral dependency scores of the Ss of Design I are given in Table 2. Although no statistically significant effects were predicted here, the analysis of variance of these scores did yield a

TABLE 2

DESIGN I: ANALYSIS OF VARIANCE AND GROUP MEANS OF
INDIRECT ORAL DEPENDENCY SCORES

Source	df	MS	F	P
Anxiety	1	36.96	2.00	$p < .20$
Sex	1	246.07	13.32	$p < .001$
Anxiety X Sex	1	10.87	0.59	
Total between groups	(3)			
Error (within)	(44)	18.48		
Total	(47)			

N = 12	HTA(boy)	HTA(girl)	LTA(boy)	LTA(girl)
Group Means	6.99	10.56	7.79	13.27

statistically significant Sex effect ($p < .001$), girls having a higher mean indirect oral dependency score than boys.

Design II

It will be recalled that the Ss composing the four groups of Design II were high- and low-defensive Ss, all of whom were low-anxious in that they did not admit to being anxious about tests and other school-related activities. Group means and the analysis of variance summary table for the indirect oral dependency scores of these Ss are given in Table 3. The analysis of variance of indirect oral dependency scores in this design yielded a statistically significant Defensiveness X Sex interaction effect ($p < .001$). This interaction resulted from the fact that the mean indirect oral dependency score of HD boys was higher than that of LD boys, whereas the mean score of HD girls was lower than that of LD girls. The results of t-tests revealed that both of these differences were statistically significant ($p < .01$, two-tail test). Thus, the difference between the mean scores of boys was in the predicted direction, whereas the direction of the difference between female means was opposite from that formally predicted. Group means and the analysis of variance summary table for the direct oral dependency scores

of the Ss of Design II are given in Table 4. As expected, the analysis of variance of these scores yielded no statistically significant effects.

TABLE 3

DESIGN II: ANALYSIS OF VARIANCE AND GROUP MEANS OF
INDIRECT ORAL DEPENDENCY SCORES

Source	df	MS	F	P
Defensiveness	1	0.03	0.00	
Sex	1	2.14	0.14	
Defensiveness X Sex	1	306.99	19.73	$p < .001$
Total between groups	(3)			
Error (within)	(44)	15.56		
Total	(47)			
$N = 12$	HD(boy)	HD(girl)	LD(boy)	LD(girl)
Group Means	12.88	8.25	7.79	13.27

DISCUSSION

The inkblot protocols of the high-test anxious and high-defensive boys of Designs I and II, respectively, contained significantly more oral dependent references than did the protocols of low-anxious—low-defensive boys. Insofar as boys are concerned, therefore, the findings are consistent with the

TABLE 4

DESIGN II: ANALYSIS OF VARIANCE AND GROUP MEANS OF
DIRECT ORAL DEPENDENCY SCORES

Source	df	MS	F	P
Defensiveness	1	0.00	0.00	
Sex	1	2.97	0.15	
Defensiveness X Sex	1	60.53	3.11	$p < .10$
Total between groups	(3)			
Error (within)	(44)	19.45		
Total	(47)			
$N = 12$	HD(boy)	HD(girl)	LD(boy)	LD(girl)
Group Means	7.82	5.08	5.59	7.34

hypothesis that both highly anxious and highly defensive children are children in whom conflicts involving dependency needs play prominent roles. In addition, direct oral dependent references were found to a significantly greater extent in the inkblot responses of high-anxious—low-de-

fensive boys than in the responses of low-anxious—low-defensive boys, but no reliable differences between these two groups were found in the number of indirect oral dependency responses. Further, percepts indirectly reflecting an oral dependent orientation were found to a reliably greater extent in the inkblot responses of high-defensive—low-anxious boys than in the responses of low-defensive—low-anxious boys, but no reliable differences were found in the number of direct oral dependency responses in these two groups. Both of the predictions were supported, therefore, but only for boys.

These findings support the thesis that (a) dependency needs play a prominent role in the personality dynamics of anxious and defensive boys; (b) these needs are manifested in a more indirect or subtle manner in defensive boys than in anxious boys, thus indicating that there are important differences in the kinds of defenses they employ; and (c) it is possible to reliably predict differences in the inkblot protocols of boys on the basis of their performance on the anxiety and defensiveness scales.

Two findings involving the girls of Design I require discussion. First, contrary to the case with boys, the mean direct oral dependency scores of high-test anxious girls did not differ significantly from the scores of low-test anxious girls. It is noteworthy that in previous studies using the Test Anxiety Scale for Children there has also been a tendency for predictions to receive more support in the case of boys than in the case of girls. We have concluded elsewhere(5) that this may be due in part to the failure to consider the problem of sex differences in choosing items for the anxiety scale. In other words, the content of these items may tap areas of anxiety more pertinent to boys than to girls. To the extent that this is true, it is possible (for example) that our group of high-test anxious girls may be composed both of Ss who are extremely anxious about test situations and Ss who are only minimally anxious about tests but say they are anxious because they feel it is the socially expected way for a girl to behave; or our group of low-test anxious girls may be in part composed of Ss who are not anxious about areas relevant to the items on our anxiety scale although they may be extremely anxious about other areas.

The second of the findings involving the girls of Design I which requires discussion is the unexpected but significant Sex effect on the indirect oral dependency variable, girls having higher indirect oral dependency scores than boys. One can speculate that this difference may be related to the types of responses which were scored "indirect oral dependency," such as references with protective implications and references to toys and to earlier childhood years, which our culture allows girls to continue holding onto and thinking about longer than boys. Put another way, we allow the expression of more dependency behavior on the part of girls, although this does not necessarily imply that girls have many more (or more severe) conflicts related to dependency needs than boys. These two findings suggest that further refinement and study of the Test Anxiety Scale for Children

and our measures of oral dependency—paying particular attention to sex differences—should precede rejection of the hypothesis that there is a systematic relationship between anxiety and dependency in girls.

There was also an unexpected finding involving the girls of Design II in that high-defensive, low-anxious Ss had a significantly lower mean indirect oral dependency score than low-defensive, low-anxious Ss. Since this is a reversal of a predicted relationship it should be replicated before an attempt is made to do anything more than speculate about its possible meaning. It is interesting to note that the indirect oral dependency scores of high-defensive girls were more like those of the boys of Design I (high-anxious, low-defensive, and low-anxious, low-defensive), than like those of either the girls of Design I (high-anxious, low-defensive, and low-anxious, low-defensive), or the high-defensive boys of Design II.

Retrospectively, and in line with our speculation about the scoring rationale of indirect oral dependency, it seems to follow that the defensive girl who cannot give even relatively indirect expression to her dependency needs—although such responses would be consistent with expected sex-role behavior—is even more constricted than the high-defensive boy who, while also not able to express his dependency needs directly, is at least able to express them indirectly. In other words, we are suggesting that in view of sex role and other social pressures in our culture, perhaps it is indicative of the presence of even more severe underlying conflict for a high-defensive girl to score low on the indirect oral dependency variable than for a high-defensive boy to obtain a relatively high score. Finally, this reverse finding also suggests that the Defensiveness Scale may be of value in the prediction of sex differences on other variables, especially when used in conjunction with other personality measures.

It does not seem platitudinous to observe that it is increasingly important that our personality measures and theories pay more attention to the pervasiveness of sex differences in personality development and organization and the relation between these differences and behavior.

SUMMARY

The hypothesis was advanced that dependency needs play a prominent role in the personality dynamics of both highly anxious and highly defensive children. It was predicted that (a) obvious oral receptive imagery and dependent behavior would be found to a reliably greater extent in the inkblot responses of high-anxious—low-defensive children than in the responses of low-anxious—low-defensive children, but no reliable differences in the number of responses reflecting indirect oral dependency would be found between these two groups; and (b) percepts indirectly reflecting an oral dependent orientation would be found to a reliably greater extent in the inkblot responses of high-defensive—low-anxious children than in the responses of low-defensive—low-anxious children, but no reliable differences

in the number of responses reflecting direct oral dependency would be found between these two groups.

The Test Anxiety Scale for Children and the Defensiveness Scale for Children were administered to the entire fourth-grade population of a suburban town, and subjects were selected from those children who constituted the extremes of the two distributions. Two 2 x 2 factorial designs (Anxiety by Sex, and Defensiveness by Sex) with 12 subjects per cell were employed. The predictions were confirmed for boys, but no predicted relationships between dependency conflicts, anxiety and defensiveness were found for girls. Possible reasons for the differential support accorded predictions of male and female behavior were discussed.

REFERENCES

1. FREUD, A. *The ego and the mechanisms of defense.* New York: International University Press, 1946.
2. FREUD, S. The unconscious. *Collected Papers.* Vol. IV. London: Hogarth Press, 1925.
3. HOLTZMAN, W. A. *The inkblot test: a provisional manual for research purposes only.* Austin, Texas: University of Texas Press, 1958.
4. HOYT, C. J. Note on a simplified method of computing test reliability. *Educ. Psychol. Measmt.*, 1941, **1**, 93-95.
5. SARASON, S. B., DAVIDSON, K. S., LIGHTHALL, F. F., WAITE, R. R., and RUEBUSH, B. K. *Anxiety in elementary school children.* New York: Wiley, 1960.
6. SCHAFER, R. *Psychoanalytic interpretation in Rorschach testing.* New York: Grune and Stratton, 1954, 131-132.

AGE TRENDS IN SELF-DISCLOSURE

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Self-disclosure is the most direct means by which people can make their unique identities known to others, and yet we have little systematic knowledge of its dimensions or conditions. Most of the treatises on interviewing and psychotherapy technique offer valuable leads to those wishing to maximize self-disclosure in clients or respondents, but these techniques presume subjects will only grudgingly and reluctantly make themselves known. Goffman's (3) splendid work shows how people contrive to impress others in desired ways by means of highly expurgated presentations of self, but tells little about spontaneous interviewing that goes on in everyday life. What do people typically volunteer about their personal lives? To whom do they confide this information? Are there group and individual differences in these factors?

The present writer, with a sociologist colleague, initiated a study of self-disclosure patterns, employing a simple questionnaire to measure the amount and content of personal information which subjects (Ss) had revealed to each of several "target-persons." The first study(6) reported differences associated with content of disclosure, with the sex, race, and marital status of the Ss, and with Ss' feelings toward the given target-persons. Subsequent work verified the relationship between feelings for a target-person and disclosure to him(7) and demonstrated that knowledge of another person is a further factor in disclosure to him(9). Moreover, a pronounced "dyadic effect" was apparent in disclosure; that is, people seemed to receive disclosure *from* others in proportion to the amount they disclosed *to* them(9). Another study demonstrated cultural differences in mean disclosure output: English female undergraduates were found to disclose less to all target-persons than comparable American co-eds(11).

A further investigation(10) suggested that self-disclosure questionnaire scores have promise as predictors of "interpersonal competence" and of performance in courses offered within a college of nursing. For example, a correlation of .79 was found between total self-disclosure scores of 23 sophomore students in a nursing college and their final grade-point average for all nursing courses taken through their junior and senior years. Furthermore, those students who were rated "good" at interpersonal competence with patients obtained significantly higher total disclosure scores on a questionnaire administered a year earlier than students rated "poor." It appears

from the above-mentioned variety of preliminary findings that self-disclosure is a significant variable in interpersonal behavior, and that the simple questionnaires thus far employed have promise as tools for research in this general area.

The investigation to be reported here was concerned with the question of trends in self-disclosure that might be associated with age. As young people grow from late adolescence into more mature years, their interpersonal relationships change. Parents die, and the majority of people select a mate. Since self-disclosure scores appear to be a fairly direct measure of the "closeness" between people, we might expect such scores to reflect the typical age-related changes in significant interpersonal relationships.

METHOD

Hypothesis

The specific hypothesis explored in this study was, therefore, that as late adolescents grow into later maturity, they will reduce the amount that they confide in their parents and same-sex friend, and show a concomitant increase in the extent to which they confide in the person of the opposite sex who is closest to them. Moreover, we might expect that the amount disclosed to the opposite-sex friend or spouse in the mature years will exceed the average amount disclosed to either parent or to the same-sex friend at any earlier stage. In other words, the relationship between a person and his spouse is "closer," insofar as self-revelation is concerned, than any other everyday relationship a person has entered up to that time.

Subjects

One thousand and twenty students enrolled in classes at the University of Florida between the years 1958 and 1960 served as Ss in the present investigation. Age, marital status, percentage of parents who were deceased, N for each age group, and socioeconomic status scored by the method of Hollingshead(5) are shown in Table 1. As shown, there was no significant difference between age or sex groups with respect to mean scores on Hollingshead's index, all averages falling into the range for the middle classes. The proportion of Ss who were married increased with age, while the proportion with living parents diminished with age, as might be expected in a survey of this sort.

Materials and Procedure

A self-disclosure questionnaire of 40 items [1] was administered to the Ss in group sessions. They were asked to indicate on special answer sheets the extent to which they had confided information shown on the question-

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[1] A copy of the self-disclosure questionnaire has been deposited with the American Documentation Institute, Auxiliary Publications Project, Photo Duplication Service, Library of Congress, Washington, 25, D.C., through which copies may be obtained.

Age Levels	N		Per Cent Married		Per Cent with Mother Alive		Per Cent with Father Alive		Mean Socio-economic Status Score[1]	
	M	F	M	F	M	F	M	F	M	F
17-18	53	134	0	.7%	96.20	96.15	96.20	92.54	33.98	32.13
19-20	130	174	3.08	5.17	96.15	100.00	90.77	92.54	32.11	39.02
21-22	100	105	16.00	30.48	100.00	99.05	87.00	87.62	33.34	36.51
23-24	54	27	40.74	25.93	96.30	96.30	85.19	88.89	35.88	35.38
25-29	66	34	65.15	50.00	95.45	91.18	83.33	82.35	38.13	33.85
30-39	50	37	92.00	72.97	94.00	94.59	82.00	64.86	39.58	36.04
40-55	19	37	94.74	64.86	84.21	78.38	63.16	51.35	29.55	33.46
Total N	472	548								

[1] Scored by the method of Hollingshead (5).

naire to their Mother, Father, closest Same-Sex Friend, and closest Opposite-Sex Friend (or Spouse), according to the following scale:

0: Have told the other person nothing about this aspect of myself.
1: Have talked in general terms about this aspect of myself, but not in full detail.
2: Have talked in full detail about this aspect of myself. The other person knows me fully in this regard.

Sample items are:

1. What you dislike about your overall appearance
17. Your views about what is acceptable sex morality for people to follow
7. Your personal religious views
21. The kind of behavior in others that most annoys you, or makes you furious.

Separate totals for disclosure to each target-person were obtained by summing. Odd-even reliabilities for each target-score had previously been shown to be in the .80's and higher.

RESULTS

The means [2] for disclosure to each target-person at the seven age levels

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[2] To save space, a table listing the means and SD's for self-disclosure to each target-person, stratified by age level, has been deposited with the American Documentation Institute, Auxiliary Publications Project, Photo Duplication Service, Library of Congress, Washington 25, D.C., through which copies may be obtained.

here considered are shown for both sexes in Figure 1. Means for disclosure to parents were calculated with N equal to the number of Ss with living parents. Inspection of Figure 1 shows a gradual decrease in disclosure on the part of males and females to both parents and to the same-sex friend.[3] The scores for disclosure to opposite-sex friend (or spouse) show a clear trend toward a gradual increase with age. For the 40- to 55-year age range, a drop-off in disclosure to opposite-sex friend was noted. Since 18 of the 19 males in that group were married, this implies some reduction in the amount of verbal self-disclosure exchanged between these men and their wives. Thirty-five per cent of the oldest female sample was unmarried; the scores of these older spinsters for disclosure to opposite-sex friend reduced the mean for the whole group to the level noted. Mean scores for disclosure to Mother, Father, Opposite-Sex Friend and Same-Sex Friend of these un-married older women were substantially lower than the respective means for the entire female sample. Unless these women had close, confiding relation-ships with other people besides the target-persons mentioned on the ques-tionnaire, it may be assumed that they were relatively lonely people.

Analysis of variance showed no significant differences between age levels for mean disclosure to any given target-person, a finding which held true for both males and females. The reason lay in the fact that the absolute differences between mean disclosure scores of any two age levels were small, and the variabilities about each mean were high. That there was correlation between age and disclosure to each of the target persons may be seen from the slope of the curves shown in Figure 1.

Inspection of Figure 1 also shows that, beginning with the age range from 23 to 24 years, the mean disclosure to opposite-sex friend (spouse) was higher than the mean for disclosure to either parent or to the same-sex friend at any age level. The oldest female group was the sole exception to this trend.

In general, then, the data upheld the major hypothesis of this study.

<div style="text-align:center">DISCUSSION</div>

The present data, beside showing age trends in self-disclosing pattern, may also be viewed as evidence of the "concurrent validity" (1, p. 14) of the self-disclosure questionnaire, and as a partial replication of an earlier comparison between married and unmarried Ss of similar age(6). In a sense, the trends reported here derive from a confounding of age with marriage

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[3] In the first study of self-disclosure patterns, Jourard & Lasakow (6) found that female Ss were higher overall disclosers than males. The present data, based on a wider age range, provided a selective confirmation of the earlier findings, in that the females proved to be higher disclosers to Mother ($CR = 8.31$, $P<.001$) and to Same-Sex Friend ($CR = 2.40$, $P<.02>.01$) than were the males. The differences between the sexes in mean disclosure to Father and to Opposite-Sex Friend were not significant.
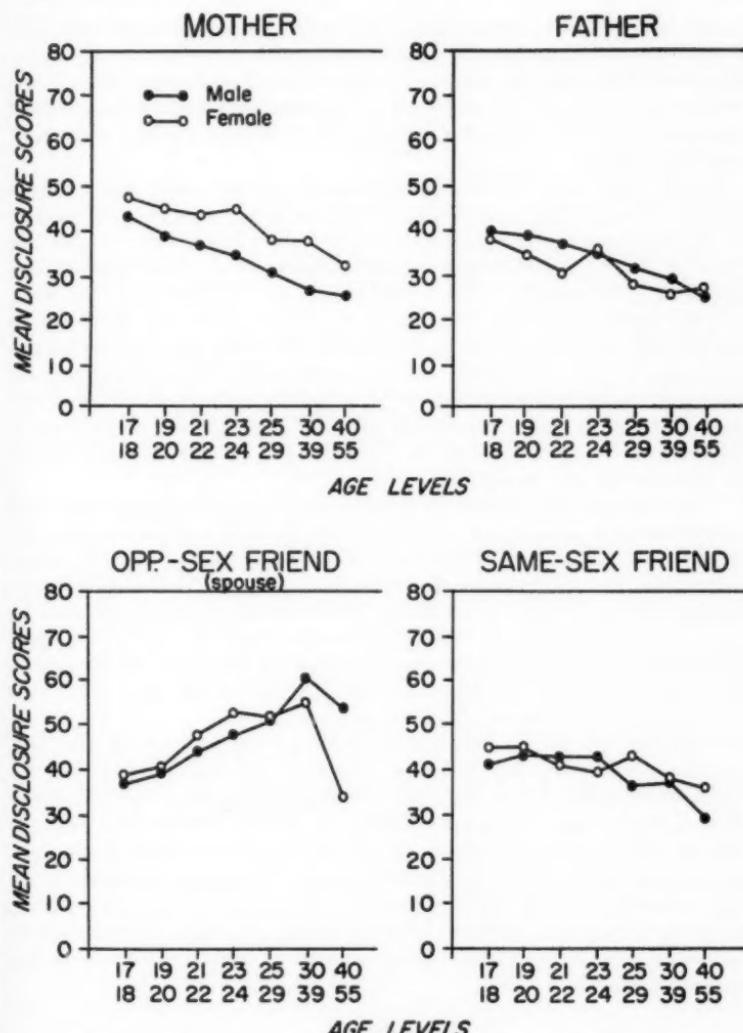
Fig. 1. Age Changes in Self-Disclosure to Four Target-Persons.

rather than from age alone. Further work will be needed to determine age changes in self-disclosure among unmarried and married Ss, considered separately.

It would be of interest to follow the age trends into younger and older ranges. Senescence is thought to be accompanied by a process of "disengagement"(2, 4), and the self-disclosing patterns should reflect this. At the younger pole, suitably constructed questionnaires might permit longitudinal investigation of the constriction or openness of children's relationships with significant others.

One of the more obvious findings of the present study was the high amount of variability in disclosure to any given target-person, irrespective of the age level under consideration. This calls attention to the need for study of individual differences in self-disclosure to a given target-person, and the correlates thereof. We already know (cf. 7, 9) that liking, knowing, and the amount of disclosure-intake from another person are all related to the amount an S will disclose to that person, but these three factors are not independent one of the other, and leave much of the variance awaiting explanation. One wonders if anxiety level, or past experiences with people who resemble a given target-person are relevant here. Certainly, whatever is pertinent to the psychology of the "transference" in psychotherapy should be pertinent in this connection.

The fact that the present data derive from a confounding of age with marital status is in some ways an advantage, because it throws unexpected light on the significance of marriage. The fullest disclosure of self seems to be reserved for a partner of the opposite sex, usually the spouse; this implies that if a person is unable to achieve a close relationship with an opposite-sex partner, he will remain with much "self" that is not expressed or realized. Possibly herein lies one reason for the avoidance of marriage — the dread or inability to "uncover" one's self before the gaze of another person, a sort of resistance against being known.

One wonders too about the significance of having much unexpressed self. We know that more self-disclosure transpires between a person and his spouse than occurs within any other everyday relationship. We also know that morbidity rates for most illnesses, as well as suicide rates, are the highest among unmarried people. This would suggest that there is a correlation of some kind, possibly curvilinear, between the amount of self-disclosure and variables from the fields of mental and physical health. The present writer has examined pertinent evidence bearing on such a correlation in another context(8), but more direct research is needed to illuminate this important area.

<div align="center">SUMMARY</div>

A self-disclosure questionnaire containing 40 items of personal information was administered in group sessions to 1020 college students of both sexes, married and unmarried, and ranging in age from 17 to 55 years. A trend was noted for Ss of both sexes to decrease the amount of disclosure to their parents and to their friend of the same sex, while the amount of

disclosure to the opposite-sex friend (or spouse) increased with age. No significant differences between age levels were found for mean disclosure to any given target-person, in consequence of high variabilities. The implications of the findings were discussed.

REFERENCES

1. AMERICAN PSYCHOLOGICAL ASSOCIATION. Technical recommendations for psychological tests and diagnostic techniques. *Psychol. Bull.*, 1954, **51**, Part 2 (Supplement.)

2. CUMMING, E., DEAN, L. R., NEWELL, D. S., and McCAFFREY, I. Disengagement — a tentative theory of aging. (Paper read at Amer. Psychol. Ass., Cincinnati, 1959.)

3. GOFFMAN, E. *The presentation of self in everyday life.* Garden City, N.Y.: Doubleday, 1959.

4. HENRY, W. E. and CUMMING, E. Personality development in adulthood and old age. *J. proj. Tech.*, 1959, **23**, 383-390.

5. HOLLINGSHEAD, A. Two-factor index of social position. Mimeographed MS, privately circulated, 1959.

6. JOURARD, S. M. and LASAKOW, P. Some factors in self-disclosure. *J. abnorm. soc. Psychol.*, 1958, **56**, 91-98.

7. JOURARD, S. M. Self-disclosure and other-cathexis. *J. abnorm. soc. Psychol.*, 1959, **59**, 428-431.

8. JOURARD, S. M. Healthy personality and self-disclosure. *Mental Hygiene*, 1959, **43**, 499-507.

9. JOURARD, S. M. and LANDSMAN, M. J. Cognition, cathexis, and the "dyadic effect" in men's self-disclosing behavior. *Merrill-Palmer Quart.*, 1960, **6**, 178-186.

10. JOURARD, S. M. Self-disclosure scores and grades in nursing college. *J. appl. Psychol.*, in press.

11. JOURARD, S. M. Self-disclosing patterns in British and American college females. *J. soc. Psychol.*, 1961, in press.
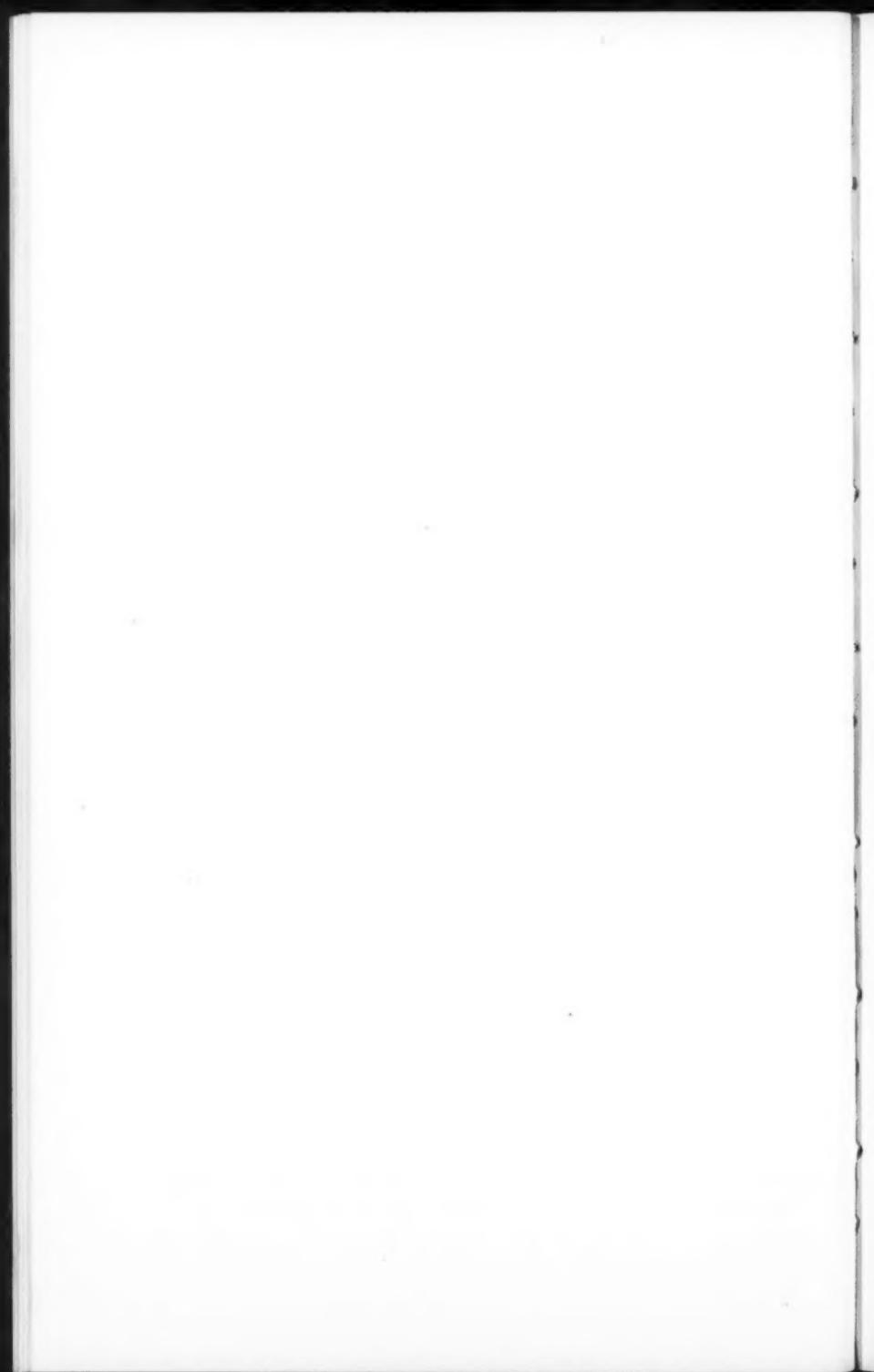
THE COMMUNICATION OF CHILD-REARING ADVICE TO PARENTS [1]

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My role in this symposium is to discuss the evidence on the nature and effects of various types of communications on information, attitudes, and behavior in mental health matters. The evidence that I have to report derives mainly from a series of studies that my colleagues [2] and I have been conducting at Stanford during the last two to three years (4, 3, 1). These studies have been concerned mainly with the role of the communications process in the acquisition of information, attitudes, and behavior changes concerning child rearing among parents. We have studied the mass media both past and present for communication content. We have interviewed parents intensively. We have obtained correlational type survey analysis data on information-seeking behavior in mothers on matters related to child rearing, and we have conducted controlled experiments on the effects of communications of various types on mothers.

Since some of our data is still in the analysis stage, and there are many more findings than can feasibly be reported this afternoon, I shall simply report some of the more interesting results thus far obtained.

Our study of advice on child rearing in the popular magazines was modeled closely after Celia Stendler's classic study, "Sixty Years of Child Training Research" (5). We took issues of three popular women's magazines—*The Ladies Home Journal, Woman's Home Companion,* and *Good Housekeeping*—beginning in 1892, the Victorian Period. Then we took 1910, the Edwardian Pre-World War I era. Then 1925, the Post-World War I period; then 1935, the Depression years; and 1950 for Post-World War II; and finally, 1959, a more or less current year. Only the *Ladies Home Journal* was available for all these years. However, for 1910-1950 all three magazines were used. Among other things, we coded all child-rearing advice with respect to amount of copy, subject matter, specificity of advice, general

method of child rearing advocated, whether the advice was couched in objective-factual terms or consisted of moralistically toned value judgments, and the source of the communication. One of our most interesting findings turned out to be the relationship between the sheer number of articles and the birth rate. During the periods of high birth rate, we found a large number of articles. The nadir for both birth rate and articles on child-rearing advice was the Depression year of 1935.

We find, as might be expected, a kind of cyclic fashion in the permissiveness-restrictiveness dimension of advice. Restrictiveness was prominent in popular articles in 1892, even more so in 1910, a little less in 1925, much less in 1935, and lowest of all in 1950. Interestingly enough, in 1959 restrictiveness shows a definite increase but has nothing like the amount of attention it enjoyed in earlier years.

It is important to note, however, that whether advice is for permissive or restrictive parental behavior seems to depend to a considerable extent on the subject matter of the article. When the subject matter consists largely of personality development or developmental stages, a la Gesell, permissiveness advice dominates. However, when physical development or socialization of infants is being discussed, the advice tends to be largely in favor of restrictiveness in child rearing. Articles dealing with the socialization of older children or with specific behavior problems tend to be intermediate along a restrictiveness-permissiveness scale.

When we now examine the kinds of content in the different years studied, we find that articles dealing with physical development and health are less prevalent in 1950 and are more prevalent earlier, as well as in 1959, when, as we recall, an upward trend in restrictiveness advice was seen. Stories dealing with personality development or with developmental stages, on the other hand, are most frequent in the permissive years and least in the restrictive years. Again, 1959 behaves like a return to restrictiveness.

Although 1959 shows this return in the direction of restrictiveness advice, it is marked also by a stiff increase in the number of articles dealing with specific behavior problems. This increase is accompanied by a decrease in global advice on child rearing. Furthermore, the nature of the behavior problems changes from such problems as getting a child to sleep, and manners, to problems of sex and modesty behavior. In 1910, bed-going was discussed as follows: "It all comes back to the matter of habit and submission to the inevitable;" in 1959, "nightmares and other fears occur at this time because the fear about injury to the genitals is too great to tolerate consciously." In general, this emphasis on a cause and effect analysis of behavior keeps increasing with the years.

In addition to the historical analysis of women's magazines, we studied a sample of the contents of current mass media. In this, we included newspapers and television, as well as magazines. Mainly, we sampled among the first six months of 1959.

Very briefly, we found some interesting differences by media in the handling of child-rearing advice. Of the three newspapers studied, the *New York Times* devoted the highest proportion of its child-rearing content to serious matters of child development and very little to humor or high adventure as compared to the *San Francisco Chronicle* and the *Palo Alto Times*. But both of the latter were exceeded by television in the proportion of "light" coverage of sports, teen-age culture, and comic material.

We coded not only explicit advice, but also the implied suggestions of fictional portrayals. It is interesting to note that the proportion of explicit parental guidance advocating the permissive handling of children is very much higher than it is in the case of fictional and other implicit advice where restrictiveness tends to be the order of the day.

A possible reason for this discrepancy between the fictional emphasis on restrictiveness and the direct literature's emphasis on permissiveness suggests itself. Parents, at a covert level, may prefer restrictive behavior or at least find themselves engaging in it more often than they would overtly prefer to do. Thus arguments for restrictive behavior are more palatable when made through fiction. The recent upward trend in restrictiveness advice in non-fiction may then indicate increased insight into this situation by parents.

Although we have no measures of the relative potency of direct versus fictional type advice, it is not unlikely that fictional may be more powerful in some respects. First, it is more likely to be attended to by larger audiences; and secondly, it can perhaps bring about changes in *emotional* responding more easily through role practice than can direct tuition. In less affective matters, one would clearly expect direct tuition to be more effective.

Let us now turn from media content on child rearing to an examination of information-seeking behavior. We do have a fair amount of data in this area. In one series of studies, we selected women of three kinds: (a) young married women with no children; (b) women with one child, a baby in his first year; and (c) women whose youngest child was in the first or second grade. When women of these three types were offered through the mails a free copy of our booklet entitled "When to Toilet Train Your Child," (while just over a third of the childless women and of the women with older children replied) over two-thirds (71%) of the mothers of infants—our "critical-period" group—requested copies. Unsolicited and unannounced mailings were made to another sample of such women. Subsequent interviews, in which a test of the booklet contents took place, produced similar results. Just under half of the pre- and post-critical groups read the booklet, while almost nine-tenths of the critical-period mothers did so.

We were also interested in the effects of an administered communication on the information-seeking behavior of persons exposed to it. Employing Festinger's theory of cognitive dissonance(2), one could predict that those people presented with an argument at variance with their initial position

would either change or stand firm. In either case, dissonance drive would increase. Among the changers, the old position would still have some attractions; and on the non-changers, the new position arguments would leave their scars. In this study, we first determined the subject's position on a nature-nurture scale and then presented a taped lecture which in some instances was consonant with the subject's initial position and in some, dissonant. More members of the two dissonant groups indicated a desire to attend a further discussion of the topic than was the case for the two consonant groups.

In other studies, we were interested in the effect of our toilet-training booklet on the information-seeking behavior of subjects. First of all, we found that some two-thirds of the women who had read the booklet did discuss its contents subsequently with someone. Furthermore, this was more likely to happen among our critical-period mothers than with other women. Although our data indicate that most people initially believe in early toilet training, most of our respondents talked to people they expected, in advance, to agree with our booklet's late training position. In fact, those changed by the booklet were much more likely to seek out and talk to people whom they expected to agree with their new position than was the case for those not so affected by our communication. On the contrary, talking with people who were expected to disagree with the message was largely confined to those people whose views remained unchanged after exposure to the booklet. Furthermore, the effect of this subsequent discussion itself was evidently to help maintain the change or non-change as the case might be. Those who changed and who did not seek out discussants were likely to backslide—to lose that change over a six-month period. However, those who did seek out discussants tended to maintain their new positions for long periods of time.

Finally, let us examine some evidence on the effects of communications on child rearing. At these meetings a year ago (4), I reported some of the preliminary findings of some of these studies. In an experiment conducted with San Francisco women, we tested the effects of a pamphlet we prepared on toilet training. We found, contrary to our expectations, that we had at least as much, if not more, immediate influence on women with no children, or with older children only, as we had on those with young infants only. These latter we labeled "critical-period" people because they were faced for the first time with the decision on when to start bowel training. We recommended delaying until the child was 24 months old or older. On a re-test of both experimentals and controls, six months later, we found that our critical-period women tended to stay changed. In our other groups, only those whose initial position was quite discrepant from the one we advocated were still influenced. Those who came close to agreeing with us initially tended to revert to their initial position, but this did not happen among the mothers of young babies. These stood firm or even, in some cases, were

sleepers. That is, although they did not change immediately, they changed over time.

A year later, we attempted to find out whether our attitudinal changes would carry over to toilet-training behavior. We found that the experimental group mothers of babies did indeed start or plan to start at almost the time they had said they would. However, our control group women—those who did not read the booklet—also tended to start training almost as late. Events tended to conspire to make them delay the onset of training: Relatives visiting, illness of mother or child, moving (even people already in California show surprisingly high mobility), and other factors tended to cause mothers to start bowel training in earnest somewhat later than they had thought they should in the control group. We didn't anticipate this finding, and now wish we had obtained a measure of guilt. That is, our control mothers should feel that they have been wrong to wait, that they may have done badly by their child, while our experimental ones should feel that they started bowel training about when they should have.

Subsequent studies have been concerned with the inter-relationship of more general attitudes with specific ones. Those data are now being analyzed. I can only say that the results indicate a complex relationship between general and specific attitudes. Whether the general communication is compatible with the subject's initial position makes a difference on its effect and interacts with the order of presentation of general and specific communication.

SUMMARY

In studies analyzing the content of mass communications on child rearing, we have traced developments in popular women's magazines since 1892 where, among other things, we found a relationship between the number of articles on child rearing and the birth rate, a cyclical change in permissiveness advice with a recent mild upswing in restrictiveness. However, subject matter changes have accompanied these swings, with permissiveness advice being largely in the area of personality development and restrictiveness advice dealing with physical development and the socialization of infants.

In our analysis of the current mass media, we found that newspapers, especially the *New York Times,* were likely to concern themselves with serious advice. Television, on the other hand, contained considerable light and humorous content. Fictional advice was found to be much more in the direction of restrictiveness, and it was speculated that fictionalized content through role portrayal might turn out to be more potent than direct advice in affectively charged matters.

We next discussed findings on information seeking. We found that critical-period mothers were more likely to seek out information relevant to their needs; and, once exposed to such overt information, to attend to it.

In further studies, one of the important effects of exposure to communications is the resulting seeking out of further information and discussion. This seeking tends to take the form of seeking support for either one's old position, if it is still retained after exposure to contrary information, or to seek support for the newly acquired position. These findings were interpreted in terms of Festinger's cognitive dissonance theory.

Finally, we found that although a communication, in terms of immediate effects, had no more influence on involved critical-period mothers than on women less involved, in terms of long lasting effects, it did have more influence. That is, with delayed measures, people whose initial position was distant from the one our communication advocated, tended to be changed as often in pre- and post-critical-period women as among critical-period women. However, for people whose position was initially nearer the one we advocated, only the critical-period mothers showed strong delayed effects.

REFERENCES

1. ADAMS, J. S. The reduction of cognitive dissonance by seeking consonant information. *J. abnorm. soc. Psychol.*, 1961, **62**, 74-78.

2. FESTINGER, L. *A theory of cognitive dissonance.* Evanston: Row, Peterson, 1957.

3. MACCOBY, ELEANOR E., MACCOBY, N., ROMNEY, A. K. and ADAMS, J. S. Social reinforcement and attitude change. *J. abnorm. soc. Psychol.*, in press.

4. MACCOBY, N., ROMNEY, A. K., ADAMS, J. S. and MACCOBY, ELEANOR E. "Critical periods" in seeking and accepting information. *Amer. Psychologist*, 1959, **14**, 358.

5. STENDLER, CELIA. Sixty years of child training practices, revolution in the nursery. *J. Pediatrics*, 1950, **36**, 122-134.

SOCIAL CLASS AND FAMILY CONTROL
OF TELEVISION VIEWING [1]

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The purpose of this paper is to examine class difference in parental policies governing the use of the family television set by the children and by the family as a whole.

When TV first appeared, several studies were made of its effects on family recreational patterns. These studies reveal substantial shifts of time and attention away from other leisure-time activities to this new entertainment medium. McDonagh(3) found decreases in the amount of reading and conversing, as well as in radio listening and movie attendance after the purchase of a TV set. However, Riley(4) found that some of the effects of TV on recreational patterns wore off as the novelty passed. Adults who had had their set for more than six months watched TV fewer hours than they had at first and resumed their pre-television levels of participation in sports. However, among pre-adolescent children, Witty(5) found little evidence of such a decline in television viewing.

The only study dealing with the effects of television on the family as an interacting group was made by Maccoby(2) in Cambridge, Massachusetts. She found that children often watch TV with other family members but seldom talk to them or otherwise interact with them in the TV setting. Despite the fact that one-third of the mothers had difficulty getting their children to come to meals and go to bed, on the whole the respondents felt TV had made it easier to take care of children at home. Indeed, most of the parents were so enthusiastic about TV that they couldn't name a single disadvantage it has for families with children.

Despite the over-all enthusiasm, it is apparent that TV creates potential problems through interfering with family routines and activities. In an exploratory study of 50 upper middle-class families in Ann Arbor, Michigan in 1955, Jenks(1) found that a lengthy series of problems had been caused by television. These included (in rank order) conflicts over program choice, interference with children's bedtime, watching too many and disapproved programs; and interference with meals, family outings, living room activities, chores, and homework.

This list of family problems posed by television suggests that parents frequently must find ways of handling conflicts among family members over

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what programs to watch and when to watch them. Three basic issues are involved: (a) the censorship of program content, (b) choice among competing programs, and (c) the establishment of limits which will enable other aspects of the child's and the family's life to proceed as desired. All three of these issues require control of the children by the parents and therefore constitute discipline problems. PTA and child study groups frequently raise questions about appropriate and effective means of discipline with respect to these issues. Yet up to the present time, almost no attention has been given by researchers to parent-child interaction regarding the control of television. The purpose of this paper is to fill that gap by investigating (a) parental values regarding TV, (b) the methods parents use in implementing those values, and (c) the effectiveness of those methods in achieving the desired results. Broadly speaking, this sequence may be viewed as one facet in the socialization process by which parents inculcate their own values in their children.

Since the American literature on socialization processes has been much concerned with social class differences in child-rearing methods, one objective of the present study is to examine class differences in the control of TV. While both McDonagh's and Maccoby's samples were representative of entire communities, they did not use social class as an analytic variable.

METHODOLOGY

The current study was carried out in Ann Arbor, Michigan in the spring of 1957 under the writer's supervision.[2] A carefully pretested interview schedule consisting of 24 open-end questions was administered by student interviewers to mothers of children between 2 and 18 years old. Two years was considered old enough to be interested in TV, and 18 young enough to be still subject to parental concern. Interviewing was limited to the early evening hours in order to minimize exclusion of working mothers. One hundred and two interviews were secured by going from door to door in two contrasting neighborhoods of the city, one an old working-class neighborhood adjacent to local factories and the other a new middle-class neighborhood of modestly priced homes. Interviewing was restricted to white families with television sets and with preferably at least two children in the specified age range (2 to 18). There were no refusals from those contacted.

The completed interviews were subsequently classified on the basis of the husband's occupation into four social classes. The Lower Lower class consisted of unskilled workers, such as janitors and truck drivers, with grade school or some high school education. The Upper Lower class consisted of skilled workers with a high school education. The Lower Middle

[2] Students participating in the project for course credit in Sociology 160 were Bailey Apple, Elizabeth Doman, Marguerite Guinane, Marilyn Mattis, Phyllis Messinger, Hazel Shaw, Sonja Stasheff, and Stephanie Wolk.

class consisted of small businessmen, supervisors, salesmen, etc., with a high school and sometimes a business education. The Upper Middle class consisted largely of professional people in private practice or on the University of Michigan faculty plus a few executives, all college graduates.[3]

Table 1 summarizes the education and family size of the respondents from the four classes.

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THE FAMILIES STUDIED, BY SOCIAL CLASS

| | Social Class | | | |
	LL	UL	LM	UM
Husband's education				
Mean years	9.6	11.3	12.5	17.5
Median	9	12	12	17
Number of children				
* age two or more*				
Mean	3.6	2.8	3.0	2.3
Median	4	3	3	2
Number of cases	25	26	24	27

It will be apparent that, despite their occupational differences, the UL and LM classes do not differ greatly in education and have similar-sized families, whereas the LL and UM classes differ considerably in both education and number of children.

HANDLING INTERFERENCE WITH OTHER ACTIVITIES

The research previously cited describes how the existence of television in the home decreases the amount of time devoted to alternative recreational activities. Does this transfer of attention occur effortlessly? Does TV disrupt other desired activities? Or do parental controls prevent such potential interference?

[3] Throughout the paper, the four social classes will often be referred to by the abbreviations LL, UL, LM, and UM for Lower-Lower, Upper-Lower, Lower-Middle, and Upper-Middle respectively. Although the 102 families are easily classifiable into low and high blue-collar and low and high white-collar categories, it should be remembered that the sampling method does not provide a representative sample of these occupational categories in the community. Nor is Ann Arbor a typical community, as evidenced by the high proportion of university professors and other professional people in the high white-collar category. Hence, the real differences which occur between occupations in this study must be treated as tentative hypotheses with respect to class differences generally in the U.S. For this reason, no attempt is made to test for the statistical significance of differences. Rather, the emphasis is on searching for general patterns of differences between groups. In most cases, differences on an individual variable are marginal in size, but when theoretically consistent differences occur on a series of dependent variables, it is possible to form generalizations about the dynamics of interaction in this particular population which may have theoretical significance for families elsewhere (see Footnote 4).

These questions can best be understood by examining the viewing habits of the children in our study.

TABLE 2. CHILDREN'S TELEVISION VIEWING TIME, BY SOCIAL CLASS

| | Social Class | | | |
	LL	UL	LM	UM
Mean number of hours				
Typical week day	3.8	4.0	3.1	2.3
Typical weekend day	6.4	6.5	5.2	3.3
Number of cases	25	26	24	27

Table 2 shows that middle-class children watch TV fewer hours both on school days and on weekend days. Viewing time is especially limited in the upper-middle class.

Controlling Viewing Time

The lengthy viewing schedule of lower-class children appears to reflect the interest of children under uncontrolled circumstances. Lack of control occurs most conspicuously in the 12 lower-class and two lower-middle-class families whose children watch TV from 10 to 12 hours per day on weekends. By contrast, only one UM family watches as much as the average lower-class family, and even this family watches only 9 hours, rather than the 12-hour maximum for the other classes.

Other data from our interviews reveal that the substantially smaller middle-class viewing time reflects in part a larger minority of mothers who limit the amount of time their children may watch. More often, however, the limited middle-class viewing reflects the middle-class mother's concern in promoting alternative activities. For example, one upper-middle-class mother reported she had "no need" to limit the total time her children can watch TV on a weekday because "They are limited by responsibilities—homework, etc.—and other activities."

Answers to the question whether the parents feel that their children are neglecting other activities by watching TV bring out two factors: (a) the amount of time the children actually watch TV, and (b) the amount of concern the parents have for alternative activities. Since middle-class

TABLE 3. REPORTED FEELING THAT CHILDREN ARE NEGLECTING OTHER ACTIVITIES BY WATCHING TV, BY SOCIAL CLASS

| | Social Class | | | | |
Activities Neglected	LL	UL	LM	UM	Total
Yes	16%	50%	38%	41%	36%
No	84%	50%	62%	59%	64%
Total	100%	100%	100%	100%	100%
Number of cases	25	26	24	27	102

parents are more concerned about alternative activities and also succeed in getting their children to watch TV less, class differences in sensing neglect of activities tend to be minimized. Similarly, since lower-class parents are less concerned with alternative activities, they should not be unduly disturbed by the long hours their children watch TV.

Table 3 shows that a majority of the mothers do not feel that their children neglect other activities for TV. The near unanimity of the lower-lower class is striking and appears to reflect a laissez faire attitude at this class level. This is illustrated by the LL mother who expained that her children "play while they watch," so that no neglect of their play activities occurs. On the other hand, UM mothers characteristically commented that TV *would* interfere with other activities were it not for parental success in limiting their children's viewing and in getting the children interested in other activities.

Although no systematic attempt was made to ascertain *what* activities were neglected, 25 mothers volunteered this information. Self-improvement activities (school work, practicing, reading, and creative activities) are mentioned most often, followed by outdoor play, sociability (with play-mates, family, or dates), chores, and a single UL class mention of "Bible Club."

In general we may conclude that television has found an accepted niche in most homes. Either it is the chief recreational activity in the LL class or it is kept within what the mothers feel are proper bounds by active parental intervention or by the voluntary choice of successfully socialized children (especially in the UM class).[4]

Controlling Bedtime

How much is television a threat to children's sleep routines? A regular

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[4] Acknowledgement is due the *Quarterly's* anonymous consultant for many helpful suggestions which have been incorporated in this paper. However, one of his comments is that "there is throughout a tendency to evaluate the behaviors of upper middles more favorably than that of lower-class families . . . This comes through by the use of 'laissez-faire' to describe lower-class parents and 'reason-able' to describe upper-middle class parents." The writer's viewpoint is that this study and many other studies show a general pattern of class differences in family life which may seem like mere prejudice but are objectively real. For example, middle-class wives are selective in telling their troubles to their husbands whereas lower-class wives tend to tell them either all or none of their troubles (Blood and Wolfe: *Husbands and Wives*, Free Press, 1960). Many studies show that marital success, as judged both by the participants themselves and by objective indices such as marital stability, is positively correlated with class status. Similarly in the present study, the author's position is that middle-class child-rearing is actually more successful in achieving such goals as the internalization of parental norms. It is possible, of course, that the class differences reported in this study and in other interview studies reflect only greater willingness of lower-class people to be honest about their troubles. However, on both theoretical grounds and by reason of the law of parsimony, it seems to me preferable to assume these differences are real until proven otherwise.

bedtime is universal in the UM families, and nearly so in the LM and UL families (only one exception each). Only in the LL class is there an appreciable number of families (4 out of 25) whose children go to bed when they feel like it.

The typical mother is asked twice weekly for permission to stay up past the usual bedtime to watch TV. (The range is all the way from children who never make such requests to those who "always" do.) For most parents this is a frequent enough occurrence to constitute a familiar discipline problem. Table 4 shows the mothers' answers to the question, "How do you handle these requests?"

TABLE 4. PARENTAL POLICY REGARDING TV EXCEPTIONS TO REGULAR BEDTIME, BY SOCIAL CLASS

Parental Policy	LL	UL	LM	UM
No exceptions	32%	31%	33%	15%
Exceptions				
For special programs	4%	19%	25%	56%
For good behavior	8%	4%	4%	0%
Weekends or favorite				
programs	12%	15%	12%	7%
Husband decides	0%	8%	4%	0%
Basis not ascertained	8%	4%	8%	4%
Laissez faire	12%	4%	4%	0%
Not ascertained	0%	4%	0%	4%
Inapplicable				
No exceptions requested	8%	8%	4%	15%
No regular bedtime	16%	4%	4%	0%
Total	100%	101%	98%	101%
Number of families	25	26	24	27

For the sample as a whole, most families grant exceptions to the children's regular bedtime under certain conditions, although there is a substantial minority who never allow such exceptions and a handful who always do.

Comparison of the four social classes shows a number of interesting differences. Most striking of all is the greater emphasis with higher social status on letting children see "special" programs. The word "worthwhile" appears repeatedly in the verbatim answers of these mothers, giving the impression that the children are not only being *allowed* to see these special programs but that the parents feel it is *valuable* for them to do so.

By contrast, low status is associated with the use of TV as a reward for extraneous good behavior or with lack of parental control over deviation from the usual bedtime. The pattern is shown even more strikingly when the families allowing their children to use their own judgment about bed-

time exceptions are combined with those who have no regular bedtime at all. This shows 28% of the LL class, 8% of the UL and LM classes, but none of the UM class with laissez faire policies governing the relationship between TV and bedtime.

We may summarize by noting that low-status parents tend to exercise either rigid control or no control over their children's bedtime. By contrast, high-status families are usually more discriminating in exercising this control, passing judgment according to the educational value of the particular TV program in question.

For one reason or another, one-fourth of the mothers have never turned down a request to stay up late to watch television. For the remaining 77, reports of how the children react when the parents don't allow them to stay up suggests that a regular system of exceptions is the easiest to administer. Whereas almost half (44%) of all 77 parents experience protests or unhappy reactions to their prohibitions, only two of the 12 parents who *regularly allow* their children to stay up for favorite programs (or on weekends) experience such protests or unhappiness on the remaining nights.

Regularity alone is not sufficient to produce harmonious results, however. If it were, we would expect similar results among the 28 parents who *regularly deny* requests for exceptions. In actual practice, a slight majority of these children struggle against the parental ban. If we remember that these parents invoke the ban whenever requests arise, whereas the other parents at least occasionally give in, this group of "prohibitionists" presumably experiences the largest aggregate amount of protestation. Apparently limits are accepted most easily by children whose parents are not only consistent but considerate in imposing them. Arbitrary consistency in limits is frustrating but reasonable consistency can be tolerated.

Locating the TV set

Much of the impact of television on the family is determined by the place where the set is installed in the house. The crucial question is whether the TV is in the living room or not. If it is, this normally means it plays a central role in the life of the family.

TABLE 5. LOCATION OF TV SETS, BY SOCIAL CLASS

Location of TV set	Social Class			
	LL	UL	LM	UM
Living room only	96%	84%	74%	67%
Elsewhere only	4%	8%	12%	26%
Both LR and other	0%	8%	12%	7%
Total	100%	100%	99%	100%
Number of families	25	26	24	27

Table 5 shows a steady decrease among higher-status families in the *proportion* of TV sets in the living room. There is a corresponding increase with status in the practice of banishing TV from the living room altogether.

The particular rooms to which TV sets are assigned vary considerably. Five sets are in bedrooms, seven in basements, and ten in dens and other ground-floor rooms. Bedrooms are used exclusively by two-set owners (not correlated with social class in this sample). Other first-floor rooms are the first choice of one-set families who wish to avoid the living room.

Some of the high-status tendency to move TV out of the living room reflects the availability and attractiveness of alternative locations. Middle-class basements are more apt to be finished off, and the "den" is a middle-class product of roomier houses and/or fewer children. Nevertheless, Table 5 also reflects the desire of high-status people to reduce interference between TV and other family activities. This interpretation is suggested by the fact that *at every class level* the average viewing time of those whose single set is located outside the living room is 2.0 hours or less, substantially lower than for the groups as a whole.

To be sure, this is both cause and effect. If the set is not in the living room, special effort is required to look at it, and viewing is presumably more often purposive, less often accidental. The extent to which viewing time is depressed, moreover, varies with the particular alternative location. Since total viewing time for non-living room single sets is not correlated with class, it is possible to compare the average for all non-living room first-floor locations (2.3 hours on weekdays) with that for basement locations (1.4 hours). Here the effect on accessibility of a flight of stairs is clearly visible.

Our respondents were asked what they saw as the advantages and disadvantages of the location they had chosen for their TV set. Confining ourselves to the 93 families faced with the problem of allocating a single set within the home, the answers are shown in Tables 6 and 7.

The striking feature of both these tables is that the advantages and disadvantages of the living room location are almost completely different from, and opposite to, those of the other room locations. Families with living room sets report advantages which imply that television has been domesticated as a major family activity. Nevertheless, many of these same families find that having TV in this convenient location conflicts with other family activities, especially with entertaining. When company comes, the adults characteristically want to "visit" while the children want to continue watching TV. Interviewing for this study in television-equipped living rooms provided vivid demonstrations of the distracting consequences of this conflict.

Avoiding such discord is the major advantage in locating a TV set outside the living room. Curiously, the only loss any of 11 families feels from relocating the set is the difficulty of supervising the programs the children watch. No one mentions the loss of comfort, and one family even sees the

inaccessibility of the basement recreation room as a gain, because it makes watching more difficult! Such families have a Spartan attitude toward the TV set as something to be kept in its place and not allowed to disrupt other aspects in the life of the family. Removing the set from the living room becomes a means to controlling its use.

TABLE 6. ADVANTAGES OF TV SET LOCATION
(FOR FAMILIES WITH ONLY ONE SET)

Advantage	Location	
	Living Room	Elsewhere
Space, seating capacity	25	0
Convenience, accessibility	21	0
Family gathering place	20	0
Comfort	11	0
Ease of supervising	4	0
Non-interference with other activities	0	8
Quiet	0	3
Improves living room appearance	1	3
Inhibits constant watching	0	1
Miscellaneous, idiosyncratic	4	0
No alternative	10	0
No advantages	6	0
N.A.	4	0
Total Responses	106	15
Total TV sets involved	82	11

TABLE 7. DISADVANTAGES OF TV SET LOCATION
(FOR FAMILIES WITH ONLY ONE SET)

Disadvantage	Location	
	Living Room	Elsewhere
Interference with		
company	28	0
music, conversation, reading	9	0
meals	3	0
activities in general	10	0
Noise, distraction	10	0
Wear and tear on room	9	0
Difficulty in supervising	0	1
Miscellaneous, idiosyncratic	0	2
No disadvantages	22	5
N.A.	7	3
Total Responses	94	11
Total TV sets involved	82	11

There is only one point at which detailed analysis reveals class differences in evaluating TV set location. This is the conspicuous tendency of LL families to feel that there are no disadvantages in the living room location. Half of all the LL families report complete satisfaction with the living room location, compared to only 17% of the 58 respondents from the other three classes. Another way of putting it is to say that 12 of the 22 families in Table 7 who say there are no disadvantages in the living room location are LL families. This high proportion is analogous to the large number of LL families who feel that their children are neglecting no activities as a result of TV (see Table 3).

For the sample as a whole, the living room location seems less satisfactory than the alternative locations. Only 27% of the living room locations offer no disadvantages, compared to 45% of the alternative locations. Conversely, owners of living room sets offer 0.79 complaints per set, whereas the "elsewheres" have only 0.27 complaints per set. Particularly striking is the fact that only those using the living room ever say that their location has no advantages or that they feel forced to place the set there. Several of these families mentioned that they plan to move their sets out of the living room or wish that they could.

To summarize the experience of these families, the living room is a convenient place to locate the TV set and is the conventional location, but it results in considerable interference with other uses of this room. By contrast, putting the TV elsewhere solves the interference problem and creates few disadvantages for families who do not want TV to be their primary leisure-time activity.

Clearly the repercussions of television on family life depend greatly on whether the set is placed in the living room or not. On the other hand, the decision where to put the set in the first place depends on the family's values and facilities. Families who value being able to watch TV with maximum comfort and ease generally prefer to use the living room's easy chairs and sofa. On the other hand, those to whom TV is less important prefer to avoid the living room location in order to free that room for the other activities which normally take place there.

RESOLVING CONFLICT OVER PROGRAM SELECTION

One of the problems which faces any group is allocating the use of scarce facilities among competing members. Unlike the telephone, which only one family member can use at a time, TV can be watched by everyone simultaneously. However, the existence of different programs on various channels raises the problem of channel selection with the likelihood of conflicts among family members with differing preferences. The minimum number of channels available to the research families is five, making the probability of conflicting interests rather high.

There are some facilities—such as the bathtub—which may be used

sequentially without much loss. It's still the same bath a half hour later. But channel selection has a peculiar poignancy because of the one-shot nature of most TV programs. If I don't see my preferred program now, I never will. The fleeting nature of TV programs intensifies the tendency of human beings to want to have their own way without delay. This "I-want" attitude is especially characteristic of the young child, and one of the major objectives of the socialization process is to help the child arrive at an appreciation of the other person's wants as well as his own. How the family handles the problem of program selection, therefore, not only affects the immediate peace of the family group but helps shape the child's social attitudes.

The problem of program selection is obviously most acute for one-set families. Indeed six of the nine families owning two sets testified to the elimination of disputes as the second set's chief advantage. Two reported the resolution of masculine-feminine conflicts in program preferences, two no longer had adult-child conflicts, and two said conflicts in general had been eliminated. (The remaining families specified advantages of convenience, such as having sets for audiences of varying size.)

Incidence of conflict

To measure the extent of conflict over program choice, all families were asked, "How often do conflicts arise between family members who want to watch different programs at the same time?" Answers were given in terms of frequency per week. One-set families typically encounter conflict over program choice twice a week. In 37 families the conflict occurs only among the children, in 7 just between the parents, and in 33 among members of both generations in various combinations. There are no consistent relations between social class and incidence of conflict.

The sources of conflict over program choice were sought among the 37 families where the children differed with each other. Two "common sense" hypotheses failed to be confirmed: Conflict was not related (a) to the number of children in the family nor (b) to the existence of sex differences among children. It is true that sex-linked preferences were mentioned noticeably often (males for cowboys and sports, females for drama, etc.) but this was not a consistent cause of difficulty. Besides, nearly all the families in this sample had children of both sexes, making comparison with one-sex groups of siblings difficult.

A third hypothesis, however, was substantiated: Namely, the more complex the age composition of the family, the more frequent the conflict. Presumably program preferences differ with age. The children were classified into the following categories: under 6, 6-11, 12-17, 18 years and older. The families were then classified according to the number of different age categories of their children. Families with children in a single-age bracket had a mean of 2.1 conflicts per week, compared to 2.5 for two-age bracket

families and 3.9 for three-bracket families. These statistics suggest that diversity of ages among children makes for difficulty in agreeing on program choice.

Resolving conflict over program choice

How do families cope with the problem posed by family members wanting to see different programs at the same time?

Where there are two TV sets, one mother comments that the answer to conflict with her husband is easy: "Mother goes to the recreation room and Father stays in the living room; we are lucky to have two television sets." However, other two-set families suggest that even this method of conflict resolution is not as automatic as it appears at first glance. Middle-class recreation rooms may be attractive but they are a flight of steps away and are not always comfortably warm in winter. Hence there is a tendency for one set to be preferred and the other to be a last resort. Family members keep hoping that they can watch their favorite programs on the preferred set. This process is visible in the following UM response: "If the girls really want the program, they can use the other TV. If the children had their special programs on first, then the father can watch the other (set). Sometimes they will all settle on the same program." In addition to comfort and inertia, the desire to watch TV together reduces the attractiveness of a second set.

Nevertheless, if they *really* want two programs, two-set families have the means to achieve this. Except for the two LL families where the husband

TABLE 8. METHODS OF RESOLVING CONFLICT OVER PROGRAM CHOICE,
BY SOCIAL CLASS (FOR FAMILIES WITH ONLY ONE TV SET)

Method	Social Class			
	LL	UL	LM	UM
Turn TV set off *	4%	12%	10%	0%
Laissez faire *	12%	4%	0%	4%
Superordinate wins ** (husband, parents)	32%	8%	15%	8%
Subordinate wins ** (wife, children)	4%	8%	15%	12%
Equality *** (taking turns, splitting program)	32%	29%	45%	33%
Variable bases *** (discussion, voting, coin-flipping, first-come first-served)	0%	8%	10%	17%
N.A. or no conflict	16%	29%	5%	25%
Total	100%	98%	100%	99%
Number of cases	25	24	20	24

* These methods apply only to conflict among children.
** Applicable only to conflict when adults are involved.
*** Applicable to conflict among any family members.

(in one case) and wife (in the other) leave the house to watch TV at the neighbor's, one-set families must find some means of choosing.

Table 8 summarizes the many different methods which one-set families use to deal with this problem. Some of these methods are used only when settling conflict among children, the second group of methods applies to conflict between husband and wife or between parents and children in varying combinations, while the third may be applied under any circumstances.

Table 8 shows that "equality" is the most common method in all social classes. Detailed analysis shows it is used especially often where the conflict is restricted to children. Usually this means taking turns alternate weeks, although a few families split the two preferred programs so the children get to watch half of each. That this may not work well is suggested by the fact that these three families have an unusually high frequency of conflict among the children.

Whereas conflict among children is usually settled on a basis of equality, differences in status more often come into play when adults are involved. This is conspicuously true of the LL class where husbands win over wives two-to-one and parents (usually the father) over children 6-to-0. Only one of the 10 cases of LL family conflict in which adults are involved is settled on the basis of equality. By contrast the middle classes are more apt to defer to the wife or children in such cases. Perhaps the term "subordinate wins" is not the most suitable one here, for the impression from the interview schedules is one of gracious concession by the more powerful family members. This attitude is typified by the UM mother who said "We usually let the children see the show since it means more to them."

We have labelled voting, discussing, flipping a coin, and first-come first-served as "variable bases" for conflict resolution because they mean that different family members get their choice at different times in contrast to a strict fifty-fifty policy or letting the same person always have his way. It is probably no accident that four out of five cases of discussion and voting occur in the middle classes, who are more accustomed to using democratic procedures in organizational settings.

Although it is by no means the predominant LL class policy, it should be noted that laissez faire handling of children's conflicts is concentrated largely in this class.

To summarize, the LL class is characterized distinctively by patriarchal and laissez faire policies with respect to TV program choice. For the sample as a whole, attempts are most often made to achieve some sort of justice in the form of compromising and taking turns.

CONTROLLING PROGRAM CONTENT

The final major area of interest involves the types of programs watched by children. To most parents, this is a matter of concern. Table 9 shows

that six-sevenths of all the families feel that there are some programs they wouldn't want their children to watch, and in most of these cases, the parents find it necessary to intervene actively in order to prevent their children watching the disapproved programs. (Potentially-controlling families are those who would ban certain programs *if* the children attempted to watch them.)

TABLE 9. PARENTAL CONTROL OF TYPES OF PROGRAMS WATCHED BY CHILDREN, BY SOCIAL CLASS

Parental control	Social Class				
	LL	UL	LM	UM	Total
Actual control	52%	73%	79%	74%	70%
Potential control	20%	12%	8%	21%	16%
Laissez faire	28%	15%	13%	4%	15%
Total	100%	100%	100%	99%	101%
Number of cases	25	26	24	27	102

Laissez faire policies, as usual, are correlated with low status, with almost half the non-controlling families concentrated in the LL class. The rationale for laissez faire policies sometimes takes the form expressed by a LL mother who said, "They have to learn sometime" (what the world is like, apparently.) The deviant UM family contained young children (the oldest is 3) whose mother feels that "anything they don't understand won't hurt them." Presumably this family will not remain permanently laissez faire as the children grow older.

The remainder of our analysis will be restricted to the 72 mothers who are actively engaged in controlling their children's viewing habits, since their awareness of this problem is most clear-cut.

Among these families, the single theme of violence (especially murder) and crime in general accounts for practically all of the objections raised by parents to particular programs. Comparatively few parents object to "dramas" and similar "adult" programs. Despite the reputed concern of the middle class with sex and violence, there was little concern about sex, romance, or love stories manifested by any class, while the concern with violence preoccupied all classes almost equally.

However, the methods used by the parents for achieving their aims do vary by social class (see Table 10). The LL class, it will be remembered, has the largest number of laissez faire families. Yet among those LL families who do exercise control, the methods used are comparatively blunt. They tend to command rather than to persuade by reasoning, and neglect completely to suggest substitute activities. Conversely, the higher-status families are more apt to employ reasoning in dealing with this problem.

TABLE 10 . PARENTAL METHODS OF CONTROLLING TYPES OF PROGRAMS WATCHED
BY CHILDREN, BY SOCIAL CLASS (FOR FAMILIES ACTUALLY CONTROLLING).

Method	Social Class			
	LL	UL	LM	UM
Direct intervention	54%	63%	79%	35%
(turn set off or change channels)				
Verbal command	38%	11%	11%	15%
Reasoning, verbal appeal	15%	5%	21%	30%
Distraction	0%	42%	37%	40%
Deprivation of privileges	0%	0%	0%	5%
Total *	107%	121%	148%	125%
Number of families	13	19	19	20

* Totals add to more than 100% since all methods used by any one family were coded separately.

When asked how their children react to control of the types of programs they can see, most parents report general success in securing conformity. However, the exceptional protests are heavily concentrated (9 out of 14 cases) among the 29 families who intervene directly. Apparently, children are apt to resent having the channel changed or the set turned off by the parents without any explanation or suggested alternative.

Similarly, most actively and potentially controlling parents felt that their children were beginning to adopt the parents' own standards regarding TV program preferences. The chief exceptions were preschool children, in all classes, who were seen as too young to have much self-control. There were only six families (3 LL, 2 UL, 1 LM) who reported complete failure to date in socializing their children with respect to program preferences. It is probably no accident that these families relied exclusively on parental intervention or simple commands as their means of controlling their children. These cases suggest the inadequacy of short-cut child-rearing methods in bringing about the effective socialization of children.

TV AND THE GENERAL PROBLEM OF DISCIPLINE

A few American parents are reluctant to purchase a TV set lest it become an unmanageable monster, creating more problems than it would solve. To check on this question, we asked our respondents how TV had affected their overall problem of discipline. Three-quarters said that TV had had no noticeable effect; the remainder were divided fairly equally between families who felt their problems were more difficult and those who felt their problems had been eased by TV. There were no class differences. In general experience these 102 families seem to have taken TV in their stride.

Because most children enjoy watching TV, depriving them of this "privilege" is a potential means of punishment for various sorts of misbehavior. TV may thus supplement the classic role of dessert in family living. When

asked if they ever take away TV as punishment for something else, most
parents said they do not, but those who do form a sizeable minority. Class-
wise, the only noticeable difference was the high proportion of UM families
(70% compared to an average of 56% for the other three classes) who do
not use TV as a punishment for "extraneous" misdeeds. Presumably this
correlates with the greater use of reasoning in solving problems, which is
characteristic of this class.

Having asked our respondents so many different specific questions, it
seemed useful to test the saliency of the various data by concluding with
the question: "If you could mention just one thing, what would be the most
important piece of advice you would give to other parents about handling
the use of TV by children?"

TABLE 11. PARENTAL RECOMMENDATIONS ON HANDLING TV WITH CHILDREN,
BY SOCIAL CLASS

| | | | Social Class | | |
Recommendation	LL	UL	LM	UM	Total
About type of control					
Strict	24%	31%	21%	19%	24%
Flexible, reasoning	4%	0%	12%	19%	9%
Sharing, cooperative	8%	4%	0%	0%	3%
Laissez faire	28%	12%	4%	4%	12%
About what is controlled					
Program content	16%	15%	25%	30%	22%
Viewing time	20%	23%	29%	22%	24%
About location of TV set					
Out of living room	0%	8%	4%	7%	5%
N.A.	0%	8%	4%	0%	3%
Total	100%	101%	100%	101%	102%
Number of families	25	26	24	27	102

Table 11 shows that more than three-fourths of all respondents advise
parental control over the children's use of TV. Moreover, the additional 5%
who advise locating the TV set elsewhere than the living room see that also
as an aid to keeping TV in its properly limited place. Most of these mothers
feel that television can play a positive role in the lives of their children, if
the proper limits are established.

By contrast, only one family in six feels that TV is simply something to
be enjoyed and shared together without parental intervention.

The major differences between social classes in their advice to others
lie in the middle-class emphasis on flexible, reasoning control and in the
lower-class interest in sitting back and unconcernedly enjoying TV. These
are marginal differences, of course, but they appear consistently throughout

this study of both the practices and the attitudes of these families with respect to television.

This study of 102 lower-class and middle-class families has found consistent differences between the social classes in their approach to television. Whereas most families control the use of TV by their children, the LL class contains a deviant minority of families who have a laissez faire attitude toward TV interference with bedtime, toward quarrels over what program to watch, and especially toward the number and kinds of programs their children watch. The LL class views TV most enthusiastically as a boon to their family life, saying that it interferes with no other activities and that there are few if any disadvantages in having the TV set in the living room.

On the other hand, where LL class parents do become involved in conflict over TV, they tend to intervene in a personalistic, rather than an ideological, fashion. That is, competition between the husband-father and others for control of the TV is apt to be resolved in his favor, and disapproval of a program the children are watching tends to be expressed by direct manipulation of the set itself or by simple personal command.

By contrast, the UM class is more concerned to keep TV under control, but at the same time is more flexible and less frustrating in its methods of imposing this control. Substantially briefer viewing time is achieved in the UM class by moving the TV set out of the living room, limiting the viewing time allowed, and encouraging alternative activities. Flexibility appears in allowing exceptions to regular bedtime for especially "worthwhile" programs and less frustration in suggesting substitute activities when vetoing a program the children desire. The UM preference for reasoning shows up in explaining the censoring of TV programs and in declining to deprive children of TV as punishment for extraneous matters.

For the sample as a whole, the data reveal relatively little difficulty in the use of TV in the family. This is not because TV is not potentially troublesome but because most families put into practice the necessary means of preventing and solving those difficulties. Most families have definite preferences about what their children should and should not see on TV and find that their children are gradually being socialized into acceptance and self-maintenance of those values. Failures in socialization are associated with arbitrary, rather than communicatively meaningful, methods of parental control.

Conflict among family members over use of TV increases with the complexity of family-age composition, but may be decreased by the addition of a second TV set or by developing systems for taking turns in the use of a single set.

All in all, most of these families feel that TV is a part of their way of life—a larger part in the lower class, smaller in the midde class—but one

which families buying their first set should keep under control rather than allow to control them. Most children come to accept this control as no better, but no worse, than other aspects of parental discipline. And these parents are confident that their children are already acquiring the parents' own values with respect to TV programs and their place in family living.

REFERENCES

1. JENKS, LOVEA LEE. "Television's Effect on Family Life," project for Sociology 160 (The Family), University of Michigan, Spring Term, 1955.
2. MACCOBY, ELEANOR E. Television: Its Impact on School Children. *Public Opinion Quarterly*, 1951, **15**, 421-444.
3. McDONAGH, EDWARD C., and Associates. Television and the Family. *Sociology and Social Research*, 1950, **35**, 113-122.
4. RILEY, JOHN W., CANTWELL, FRANK V., and RUTTIGER, KATHERINE F. Some Observations on the Social Effects of Television. *Public Opinion Quarterly*, 1949, **13**, 227.
5. WITTY, PAUL. A Sixth Report on TV. *School and Society*, 1956, **83**, 41-43.

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